

AVIATION

The Oldest American Aeronautical Magazine



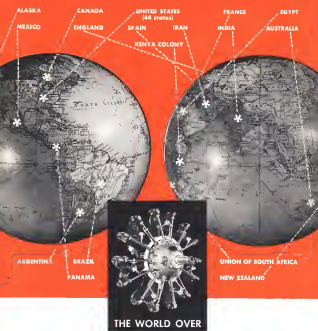
End of a Perfect Flight!

Twenty-four Twin Wasps roar in perfect unison as Navy Patrol Squadron VP-6 checks in at Pearl Harbor after a one-hop flight from San Diego, 2553 miles away. Just a routine job for these Consolidated patrol bombers. And just another evidence of the superlative performance that is built into Pratt & Whitney's two-row engines.

PRATT & WHITNEY AIRCRAFT
EAST HARTFORD, CONNECTICUT
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Pratt & Whitney were first in America to build successful 14-cylinder twin-row aircraft engines



The Jacobs Aircraft Engine Company extends greetings to its more than 500 private and commercial users throughout the world—and pledges



that it will maintain the high standard of quality of its products and its liberal service policy that have insured so greatly to the benefit of its users.

CABLE ADDRESS—JACCO, POTTSWOM



You, Too, Can Enjoy "Peace of Mind" When

Flying Under the Metal Structured Wings

of The 1937 Stinson 'Reliant'

A heritage from the larger Stinson Trimotor, many of which have flown in excess of 500,000 miles the 1937 Stinson "Reliant" wings, constructed of chrome molybdenum steel and dural, bring "Peace of Mind" to the cross country flyer.

This metal wing, coupled with the lack of physical effort when flying a Stinson, even in rough air, brings a satisfaction from flight which can come only from the superconfidence which flyers of Stinsons possess because of this plane's proven reliability.

If you have not flown in a Stinson "pull wings" "Reliant", there's a treat in store for you.

Stinson Owners are proud of these planes and want

them to be properly housed when they fly after no vacations or business, and here again the Stinson Corporation has helped to provide friendly, well equipped facilities where these "Reliants" can "rest up" with all of the confidence of the Thorobred returned to his stall.

From Boston to Los Angeles there is a chain of Authorized Sales & Service Stations operated by the "top" Aviationists of their respective areas where a Stinson Owner always has Adequate Assistance.

Enjoy flying—buy a Stinson and keep company with the largest group of cabin plane flyers in the Nation.

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Curtiss SOC-1 Navy Scouting Biplane

Houde knows metals — and how to machine them with split-thousandth precision. And, so, for its latest Navy Scouting Biplanes, Curtiss utilized Houde's skill and facilities for the production of many special parts. Similarly, many other manufacturers entrust to Houde metal-working problems calling for exceptional accuracy and faultless workmanship, coupled with lowered costs. If you have such a problem, Houde engineers will gladly discuss it with you.

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AVIATION
April, 1937
6

Curtiss

1937
MILITARY AND
NAVAL AIRCRAFT



U. S. ARMY
CURTISS Y1A-18

Devised to be the fastest
two engine military airplane
in the world, a
number of Y1A-18's are now
under construction for
the U. S. Army Air Corps.



U. S. ARMY
CURTISS Y1P-34

Both parent planes of
this type are now under
construction for the U. S.
Army Air Corps.



U. S. NAVY
CURTISS SEC-3

A large number of Scout
Biplanes of this type are
now being built for the
U. S. Navy Department's
Bureau of Aeronautics.



U. S. NAVY
CURTISS SOC-3

171 Scout Observation
planes of this type have
been purchased for the
U. S. Navy Department's
Bureau of Aeronautics.

The Curtiss Aeroplane Division of the Curtiss-Wright Corporation is the oldest airplane manufacturing organization in America. Its capacity has grown steadily during the past 50 years. Today Curtiss is one of the largest and best equipped military airplane manufacturing organizations in the world, provided with every facility for designing and building all types of military and naval aircraft in large quantities and for prompt delivery.

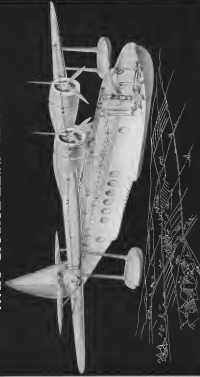
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April 1997

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- **Flying is a remarkably safe means of transportation—but only because everyone connected with aviation holds safety to be the first, last and constant consideration.**
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working from using their experience.

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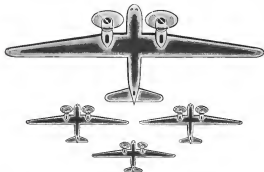
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The Wilsons. A. Wilson and J. R. Wilson.
Tuttle Tower is a Wilson's Tower.

Abstract

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BALANCED



FOR TAKING OFF..FOR CLIMBING..FOR CRUISING

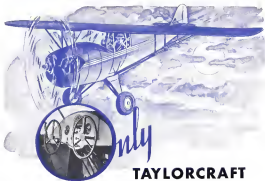
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April 1937



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36 lb. baggage allowance with 12 gallons of gasoline.

Completely grouped, easily visible instruments. Approved amateur standard equipment.

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AGAIN air transportation moves forward! United Air Lines puts 20 new Douglas-built "Mainliners" into service—giving air travelers new luxury, speed, comfort.

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Everywhere leading air lines, pilots and plane makers know that "Goodrich-Protected" means extra safety, efficiency and comfort. Decide now that you'll give your planes the benefits of Goodrich Airplane Silvertowns, Goodrich De-Icers, Airplane Blasts and more than 40 other Goodrich Aviation Products. See your nearest Goodrich dealer or write Dept. 423, International Division of The B. F. Goodrich Company, Akron, Ohio for complete information.

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As the years pass, Beechcraft maintains its traditional policy of CONTINUAL IMPROVEMENT. The basic features of Beechcrafts remain unchanged. As a result, Beechcrafts have had a satisfyingly high resale value for their used airplanes. No Beechcraft production model has ever become obsolete.

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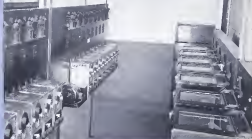
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NEW YORK OFFICE: ROOSEVELT FIELD, NEW YORK, N.Y.

AVIATION
April, 1937
16

No kind of plane graphically demonstrated constant Aviation progress, accuracy, uniformity, economy, until 1937. Pittsburgh, Pennsylvania

Holding temper under control



This picture shows a battery of control and recording instruments used for heat treatment of aircraft forgings produced by Aluminum Company of America. Temperature is held within a range of plus or minus 1° Fahrenheit. This illustrates the careful control of manufacturing processes that makes the high standards of Alcoa Aluminum Alloys.

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AVIATION
April, 1937
17

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AVIATION
April 1937

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AVIATION
April 1937

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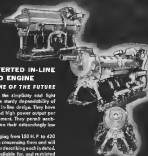
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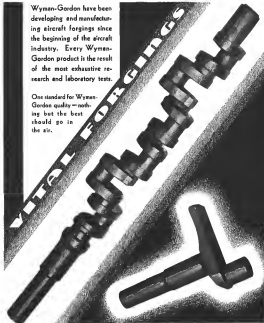


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It is you men again since leaving a grandfather, Paul D. Lewis is looking for you. Mr. Lewis is president of the Association of Flying Grandfathers, 17 Penna. Street, Portland, Pa. He is looking for new members for his venerable organization.

Speaking of pilots who begin to fly late in life Al Bennett, domain proprietor of Tropic Club, tells an interesting story. A gentleman who must have been close to the three-score mark stepped in at the office one day and asked Al if he would use his influence on the local medical examiner to get him a license. Knowing that the hopelessness of trying to change the medical mind, Al had his resignation but he wrote the letter anyway and promptly forgot about it. "I suppose his superior sense the gentleman returned to the field one day and fell confidently, 'You got my license for me—now I want to buy one of your planes'—and he fell for cash!"

SEVEN, BY COUNT, YEARS HAVE PASSED IN THE AVIATION SERVO OF ONE man. Mr. Mark's journey was full of the late of the SS Mar Camarillo, a tramp steamer that had expired more than a hurry in U. S. diplomatic and congressional circles by having an embargo drafted out of New York harbor by a coast line boat with a cargo of second hand U. S. airplanes for Madrid. But most of the paper failed to convert the facts with a little story that had ap-

peared in the N. Y. Times under a February 4 date line. "Reverend, not please needed by Spanish Loyalists" was the headline, and the story told of how the Mar Camarillo's sailing from Vera Cruz had been delayed many days waiting for a cargo of bombs. Perhaps if she had gotten all away promptly she might have eluded the latest warning. Sounds to us like the old story of "the start of a horse and the battle was lost."

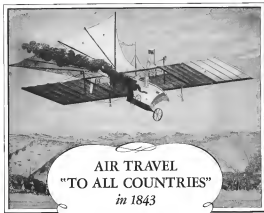
WHEN someone out of a couple of Gals we had with Cooks during one Sunday in Paris. They were veterans of the first, and only, full scale bombing attack made by aircraft against any U. S. warship since 1918. Attached to the Destroyer "Kear" coming in Spanish waters, they suddenly found bombs bursting about their ears from an airplane which was apparently just casually passing by. After several weeks had taken considerably close, Commander Alvin, reported that there had been no results, reported his ship in the second quarter, sustained his anti-aircraft battery. It was his whole life, but fortunately no one was hit on either side, and the incident wound up in a share of headlines apologies from both Spanish governments.

INTERESTINGLY, in showing the top-notch air mail, promoters a thing at two Fortresses Mary Copleston got the public winds to

put on an air mail poster center for the people. The result was so good that a series of the posters are on exhibition at the U. S. Post Office Department in Washington. Some are novel advertising, some amazingly original, some simply show what the little kids will think of. Don Stebbins of I-H was first prize with a silver and black stock of flossers, neckties, socks, with a mail plane shown.

NINE YEARS AND WE REMEMBER that actual return was coming to be quite a problem, that aircraft are there had appeared, competent dominants to supervise the selection and preparation of food for passengers. That this is so would have been disclosed by one of our elegant instructors who made a very probable comment that the 15 lines that serve meals on planes had a food bill for 1936 close to half a million dollars!

ADDITIONAL AMERICAN AIRMAIL CHIEF OFFICE posted carefully at the stamped, built around his last month—described, sorted, compared—finally concluded that Theodore C. Baker, 40-year-old automobile dealer at Brooklyn, Mass., had shipped A.A.'s Seat No. 1,000,000—was therefore the first "millionth passenger" on any line in the history of air transportation. Reward of his careful shipping showed the "Daily Star" at Boston's airport at 9 o'clock on the morning of Feb. 16 (Pleasant-



AIR TRAVEL "TO ALL COUNTRIES" in 1843

NEARLY a century ago, an optimistic English engineer named William Samuel Henson attempted to organize the "Aerial Transit Company" for regular air travel "to all countries." The vehicle to be used by this "gigantic enterprise" was the Henson Aerial Steam Carriage pictured above—the first airplane design to propose the monoplane.

Henson planned to use a 25 to 30 horsepower steam engine to furnish the power, actually completed a light-weight 10 horsepower steam engine to fly a model one-seventh the size of his proposed big air

liner. Not one of Henson's models ever got off the ground, largely because of a woeful deficiency in his power-weight ratio.

Only with gasoline and the gasoline engine did heavier-than-air craft become a practical reality. Constant progress in engine horsepower and power-weight ratio has demanded constant progress in fuel characteristics. Today, Ethyl Aviation Gasoline is keeping pace with present demands, and Ethyl engineers are cooperating in further progress. Ethyl Gasoline Corporation, Chrysler Building, New York, N. Y.

board for a lot of a vacation) in a gold mine, a free trip to Europe (on the Hindenburg), and \$1,000 cash for miscellaneous expenses. Not bad, Mr. Baker!

Further and much more difficult research by the A. Anderson established the fact that Mrs. Gardner Fiske of Boston 1146 Mass. was the last of the passengers. She was Customer No. 1 on A.A.'s earliest venture—Colo-Bird Air Transport.

30 THE AVIATION COMMITTEE of San Diego's Chamber of Commerce has announced the opening of a central meeting place for aviation people. Donald Egan, manager of the Hotel San Diego, has set aside a special room in the hotel which he calls the "Sky Lounge". It is equipped with telephones, writing desks, and other conveniences, and the walls are being decorated with aviation photographs. Membership cards are being mailed to prominent persons in the field of commercial, military and naval aviation.

31 SENSATIONS OF TRANS-ATLANTIC AIR TRAVEL, a FAA-News letter points out that probably fewer than one in a million realize that, with the exception of our 700 mi. gap, regularly scheduled air service practically spans the Western Hemisphere from Palo Alto, California to Moscow, from America's Pacific-Alaska Airway to Japan (direct service to Seattle) by air from Seattle-Chicago-Miami. Miami across the Caribbean to Havana, continue from America's Great to Santiago, Chile; Moscow Airline—Santiago to Manzanera at the tip of South America. About from the Arctic Circle to the Antarctic. With the exception of that one summer gap, a 11,000-mile route radiates from within 1,200 miles of the North Pole to within 1,200 miles of the South Pole. Incidentally, the running time on this Arctic Antarctic



THIS WINGS DOGS—

when this huge rubber nose late motion. The central surfaces of the Army's latest biplane—Beech's YB-10 "Tiger" have been built for the Army, which recently bought the first of the production models in Langley Field from the Beech factory.

were in eight days, including the two days required by the steamer to get from Japan to Seattle.

ABOUT THIS ISSUE . . .

Never before has so much current information about this Aviation Industry in America been assembled between a single set of covers. We have gathered over developments today and our annual statistical reviews have become classic, but never have we attempted both together until this year. And the result seems to be so well worth the effort that a Combined Statistical and Directory Issue is placed as a regular feature of Aviation's service to the industry.

The time tells naturally into five sections. First come the airplanes,

with general and descriptive material followed by detailed specifications Tables. Next, the engines with pistons and complete cylinder treatment. Then the "Record of Progress" for 1935—a complete picture of our status, commercial and military, in World Aviation. Immediately following are our regular monthly News Sections. Finally, a Classified and an Alphabetical Industry Directory.

A word about the statistical section. Don Ryan, general manager of our Staff, now with Pan American—old up many nights over it, carried the bulk of the load of preparation. Elmer Stahlfield of our Washington Office did personal service in typing figures out of governmental files. To this, as a contributor our thanks (—and a check). To Stahl, as a staff member, our sincere appreciation.



SAFE LANDINGS!



BENDIX

LANDING GEAR
EQUIPMENT AND
PILOT SEATS

STANDARD EQUIPMENT ON THE LARGEST AIRLINERS

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Side Slips



By
**ROBERT
OSBORN**

WHILE ARRANGING SOME OF OUR CHAIRS IN THE FIVE FRONT THEATERS near The Grand Auditorium, I remarked that he didn't read the papers much but he'd heard talk that nearly every European and Asiatic country had decided to liquidate armament agreements, and that many of them were increasing the length of required military service, and some governments were running campaigns for larger landings, and again were being arrested everywhere, and he was

Also, if we are to believe the funny papers and the comic magazines, all emperors take delight in being on their back's legs, so that a collection will probably be demanded for the next space race.



derived if the thought had occurred to anybody that there might be a war brewing over there?

IN A RECENT NEWSPAPER, AFTER answering questions on air line traffic in the statement, "Man want to know if it will do any good to take along their despatchers and see how that typewriter are on hand because cut fly with the plane?"

This, we believe, is a serious con-

side on the part of the air line as nothing will be done and none laughing to the other passengers then to listen to the unimpressive business men start all nations in the same laughing manner, "You-absolutely of the air-30th content at hand such-country said. It-is-very would long to-be-possible as follows"

Several FOREIGN GOVERNMENTS seem to be seriously considering the use of captive balloons supporting a cage of dinghies and cables up to 20,000 ft. as parachute for big ships against air bombing raids in the next war, and work is actively going ahead on the project.

Aside to the American Manufacturers—Here's your chance to sell the first aerial "mass parachute,"—airmen with cypher blades mounted on the rotor tips.

ROBERT OSBORN REMARKED THAT the Russian Society of Air and Chemical Defense has just announced a special war training program for children, 12,000 will be equipped as experts in aviation construction, 750-

000 as anti aircraft defense experts and 200,000 will be trained as mechanics, using special anti-bore rifles furnished with 6,000,000 rounds of ammunition.

This seems to me to be an excellent defense measure. Having observed the devastating effect on a small community of just a few boys armed with



3-5 air guns, we can't imagine an army willing to invade a country where 200,000 children are equipped with rifles and plenty of ammunition.

WE ARE NOT MEANT TO BE THAT the recent shake-up of the Bureau of Air Commerce Mayor E. W. (Shorty) Schroeder has been named Assistant Director.

Because of his active flying since the very early days, Shorty's experience has been great and his adventures have been many and varied, but one in particular stands out vividly in mind. For the Gasparbarn Safety-Airline Corporation, 1925 St. Louis at Market Field, he had designed his own idea of a safe airplane. It was a cabin plane with variable-number wings and with track systems, and early of many a morning the Mayor could be seen standing out of the ship to pace off the take-off and landing distances with his trademark stride. Confidently, he told us that the lateral control never's all that could be desired when the wing was in the high-number position.

One morning he pulled the ship off the ground slowly and up into a steep climb. Just as he was over the line of laughter one wing dropped a bit, and so up at the controls continued to go slowly slowly. Finally the ship just missed the chimney of the Midland Field Hospital and dropped out of view.

When we arrived, breathless and pop-eyed, at the scene of the accident, there was his ship screeled and upside down in the exact corner of the left house. Shorty was climbing beside it grinning and rubbing his elbow. "Take notice," he said, "one I always land my ship back onto the airport again somehow."

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purposes and it is practically impossible to purchase anything for export or for non-military use. This threat open to American manufacturers a vast commercial market that has hitherto been difficult to penetrate. But this condition is only temporary, and, so will be shown presently, carries with it some rather unfortunate implications.

Two serious reasons for our rising export market, and the one on which our future success in developing those markets must be based, is the undeniable superiority of quality of our goods. Stand up any American airplane, engine or most of equipment with samples of the same class from any producer in the world, and the differences in our favor are immediately obvious. In materials, design, workmanship and finish, our goods are outstanding. Quality is our best selling point.

The greatest danger to our position in world markets comes through cut-throat price competition. The fact the European nations are building aircraft on such a huge scale creates difficulties quite apart from the threat to the price of Europe and of the rest of the world. Clearly, when governments underwrite the huge engineering and development costs connected with the design of any airplane, and also provide factories and selected manufacturing facilities for construction, it

costs very little to lay down commercial airplanes on contract all over the world. As convertible military models become obsolete or as the pressure for production for war purposes is relieved, competition from such sources will become more and more acute. In fact, the focus of such competition is already being felt. Classic example is the Junkers 52, an airplane of relatively recent vintage which has been and still is being produced in large quantities in Junkers's Dessau plant. These ships have the backbone of Germany's "commercial" fleet and reserve air force, but now that newer machines such as the Junkers 86 and Heinkel 111s are coming along for service squadrons, more and more of the 52s may be diverted from the military and used to compete with other countries in commercial and military export markets. Junkers can and does offer these machines all over the world at prices that are ridiculously low because charges for overhead and development have long since been written off by the German government.

Against such competition, quality is the only answer. We must continue to offer to the world machines and equipment of such high standards of quality and performance that price considerations become secondary. Quality is our story and we must stick to it, unless we want to lose the substantial foothold that we have already gained in world markets.



Part of Army stock.

NOT FOR EXPORT—

are these P-40s of the United States Army here shown, undergoing final tests before shipment as their brilliant new order to Russia has been placed. Out of ten, three by Consolidated Aircraft, they represent but

used in aerial air operations. The engines are Pratt and Whitney Twin Wasp. Bell Aircraft of Buffalo furnished the wings (engine center section) and a tail section. With the remarkable wing tip shape,

AIRPLANES FOR 1937

In the pages that follow we present the latest available information on what America has to offer to world markets. Models now obsolete (and therefore not readily available commercially), as well as those not yet released for general use under Army and Navy restrictions have been omitted.

Illustrated are 36 types. Included in the Specification Tables on pages 66 to 68 are the technical details of 361 models. With each illustration is an index number keying it to the Tables. Company names, addresses and head personnel (where known) will be found in Alphabetical Industry Directory, page 118.



Aero Engineering Corp.

Aviaca's air two-place airplane held in the Atlantic power Aerocar 1-5, designed along transport lines to bring to the general pilot more of the

Aerocar 1-5

Features omitted is standard in 1937 all-wood airplane. Accessories by Aviation, Building and General. Specifications, 1.



Aeromarine Corp. of America

Aeromarine has stepped out with a new model that looks so little like a transport of the old one that you could hardly recognize it. It may find niches in the

Aeromarine K

New York Stock. Accessories by Good, you, Flash, Diesel & Black. Stockpiles in Port, Shattuck, Aeromarine and Johnson. Specifications, 2.



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Aerocoastal Corp. of America Aerona LC, LCS

The latest version of the low wing Aerona, comes as either biplane or monoplane. Both are powered by Walter engine. Accessories by: Gombert.

Sensory, Pyrene, Malespina, Haupt & Klink, Moschou, da Font, Senise, da Font, Azeiteiro, and Edo. Specifications: 2.



Air Transport Mig. Co. Ltd.

Five models are offered with one, two, and three engines. The single-engine types, P-2 and P-2B are sport and business class. The T-4 has three engines.

T. A. B.

engines and the B-6 and B-6-S have two Wright Whirlwinds. Both multi-cylinder models are an sleek, light transports. Specifications, 120-121



Amer. Eagle-Lincoln Aircraft Corp.

Powers with the 43 hp. Sokolov argue the American flag, has not changed materially in the past year. Special equipment includes a simple burglar

Excerpt

stabilizing system and complete dual controls. Assessments include fire-experiments, first aid kit, log books, safety belts. Specifications: 5.



Argonaut Aircraft Co. Inc.

An investment of \$50M should attract a number of private pilots. The First is a 3 place Monaco powered Aero-sports by Conquest, Kato, Raso.

Pirate H-24

Gyimes, Pýross, Jolános & Johnson
Johnson & Pauline Shokrensen Nor-
well, Pýross Kollman, and Nelson &
Hays. Supplement 148



Arrow Aircraft Corp.

ARMED MEN, F. PLAYERS (Food V-4) are beginning to turn up in airports in considerable numbers. Accompanied by Felix Goodrich Goodhyatt, Haym, 994

Model F

land, Pyrene, de Font, Massé & Blach.
Soudan, Goussé, U.S. Geogr. Acro-
mont, Font, Natchez-Boyley and
William, Sacramento ?



Aviation Mfg. Corp.

First attempts have been made at the DDT model at the Value $V \geq A$ for business buying and single engine transport. According to Gouvyard Hamed

Vertices V I II

von Standen, Erigeron, Fuchs, Kallie
Wiley, Scammon, Grouse, Powers, Kallie
von, Wilhelm, Maxine, Mito, Meyer, and
Sperry. Specialization 1





Aviation Mfg. Corp.

Vultee V-11GB

The V-11GB can be built as either an attack plane or a bomber. Like the transport ship, both use Wright Cyclone engines. Accessories by Hamilton.

Standard, Eagle, Goshawk, Eclipse, Duxon, Wiley, S. & M. Feltz, Grinn, Wilson, Trimmer, Koller, Moss, Moss, Walburn and Perry Specifications, 9.



Barkley-Grow Airc. Corp.

TGP-1

The Barkley-Grow transport is a new addition to the all-metal twin-engine airplane group. Accessories by Goodwin, Hamilton-Standard, Ohio.

Standard, Eagle, Grinn, Adams & Westlake, Koller, Thomas, Koller, S.C.A., Koller, Wilson, Trimmer, Moss, Moss, Walburn and Perry Specifications, 10.



Beech Aircraft Co.

Beechcraft C17, D17 Series

Two types are now being made on the D17P (Wing) Beechcraft. Other Beechcraft include the C17L, C17B and C17C. Accessories by Elmer, Eagle.

Fulton, Hamilton-Standard, Chase, Grinn, Eagle, Laidlaw, Patterson, Wilson, Koller, Trimmer, Moss, Moss, Walburn and Perry Specifications, 11-14.



Beech Aircraft Co.

Beechcraft 18(A), 18(B)

Beech is expanding its twin engine line to two models—the 18(A) (Wright 520 hp) and 18(B) with 385 hp Jumbo). Accessories by Elmer, Eagle, Fulton.

Schum, Hamilton-Standard, Cameron, Goodwin, Laidlaw, Patterson, Wilson, Koller, Trimmer, and Wilson Specifications, 15.



Bellanca Aircraft Corp.

Pacemaker, Skyrocket

New arrivals are the Super Pacemaker (100 hp Wright Warblers) and the Super Skyrocket (100 hp Warner Whips). Accessories by Grinn, Hamilton-Standard, Ohio.

Standard, Eagle, Grinn, Adams & Westlake, Koller, Thomas, Koller, S.C.A., Koller, Wilson, Trimmer, Moss, Moss, Walburn and Perry Specifications, 16, 17.



Bellanca Aircraft Corp.

Aircruiser

The Aircruiser (Cyclone) (highly efficient or simple) is a single-engine with the characteristic Bellanca wing form blended into wing struts. Accessories by Grinn, Hamilton-Standard, Ohio.

Standard, Eagle, Grinn, Adams & Westlake, Koller, Thomas, Koller, S.C.A., Koller, Wilson, Trimmer, Moss, Moss, Walburn and Perry Specifications, 18.





Bellanca Aircraft Corp.

When Jimmy Bellanca created the Airplane at 257 m.p.h. last fall he flew a new Wing Bellanca 28-70. Accessories by: Bendix, Goodrich, Hamilton-

Flash 28-70

Standard, Kachay, Pyle National, Pyram, Riden & Ross, Kalamazoo, Sperry, Lewis, Linker, and Weston. Specifications, 15.



Boeing Aircraft Co.

Five companies have filed an inter-collective patent on the Boeing 247-D. Accessories: Warner, Hamilton-Standard, Goodrich, Goodyear, Fisher, Bur-



247-D

gen, Kibbe, Seaman, Pittsburgh, Thomas, Dayton, Edison, Sperry, Kalamazoo, Weybridge, Mate Motor, Sperry, Kibbe, 15.



Burnelli Aircraft, Ltd.

The Burnelli UB-14 has been developed to the point where it is being seriously considered for air transport use. Accessories by: Goodrich, Auelin,

UB-14

Chenard, Eide, Hamilton Standard, Pyle National, S.K.F., Hotel, American, Windsor, Kalamazoo, Pioneer, Sperry, Specifications, 127.



Cessna Aircraft Co.

The Cessna Warner powered C-37 is an improved version of last year's C-34 but generally similar in design having the usual Cessna cowling wing. Ac-

C-37

cessories by: Bendix, Warner, Poles, Pedersen, Fisher, Goodyear, Kalamazoo, Pyram, and Kalamazoo. Specifications, 21.



Crusader Aircraft Corp.

No previous designs have been made in the AG-7 Crusader since last year. The engine is the Warner CR-4 (100 hp. at 2000 r.p.m.). Accessories by:

AG-7

Goodrich, Auelin, Kachay, Chenard, Hamilton-Standard, Fisher, Goodyear, Kalamazoo, Haul, and Sperry. Specifications, 128.



Curtiss-Wright Aircraft Co.

Designed as a basic trainer, the 19-R becomes a two-seat fighter by installation of a fixed and flexible gun, and bomb racks and an aileron plane by an-

19-R

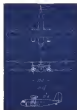
ing fixed gun in the landing gear compartment. Accessories by: Curtiss-Wright, and Hamilton Standard. Specifications, 20-22.

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Curtiss-Wright Airplane Co.

POWERS AIR PLANE was the Curtiss Center and many are still in service. Eighteen passengers are carried by day and twelve by night. At a slower rate

Centor

which is divided into six upper and lower decks and is following in 1933-1934 the usual Pullman practice. Specifications, 125-131



Curtiss-Wright Airplane Co.

POWER PLANT AND AIRCRAFT are shown for the Shrike in an all-metal low wing aircraft. They are powered by the Wright Cyclone engine (275 hp. at sea level). The

Shrike

landing gear is the fixed type with streamlined wheel fairings. Accessories by: Bendix and Hamilton-Standard. Specifications, 26.



Curtiss-Wright Airplane Co.

ANOTHER of many Hawks has been announced clearly with the highest type for many years. The latest Hawk 75 is a low wing single engine monoplane of

Hawk 75

the best performance type. Power is the 300 hp. Wright Cyclone. Accessories by: Curtiss and Hamilton-Standard. Specifications, 29.



Curtiss-Wright Airplane Co. Hawk III, IV, HF12C

CHINA AIRCRAFT of the Hawk family are being designed III, IV, and HF12C with Wright Cyclone engines. See also in design is the Navy HF12C, five

motor fighters powered with the 300 hp. Cyclone. Accessories by: Hamilton-Standard and Bendix. Specifications, 30, 31.



Curtiss-Wright Airplane Co.

THE SEAGULL is probably as efficient a land or seaplane. Power plant is unknown in the 100 hp. Pratt & Whitney Wasp. A steel and fabric covered

Seagull

type, the Seagull has underwing arrangement for two persons. Accessories by: Pratt & Whitney, Hamilton-Standard. Specifications, 32.



Douglas Aircraft Co.

THE DOUGLAS DC 2 has been used more extensively than the earlier DC 1. Almost every major airline throughout the world has taken advantage of the

perfect economy of this ship. Power plant equipment includes the Wright Cyclone or Pratt & Whitney Model engines. Specifications, 132.

DC 2



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Douglas Aircraft Co.

Latest engineering cost per passenger seat has led a large number of air lines to switch to DC3 equipment. Passenger capacity is twenty-four for day or ac-

DC 3, DST

tion or a sleeper (DST). Many interior variations are available. Accessories by Budd, Hamilton-Standard and Sperry Gyroscopes, Ltd., Ltd.



Douglas Aircraft Co.

The DC long range design team is now in production at the Santa Monica factory. All-metal construction and retractable wing tip floats are features.

DF

Accessories by: Davis, Edgely, Hamilton-Standard, Gifford, Watson, Electric, Lee, Sperry and Cambridge. Specifications, 130



Fairchild Aircraft Corp.

Two variants of the 24 are now available, the Warrior and Ranger powered. The former is shown above. Accessories by: Goodrich, Goodrich, Warner, Har-

rell, Reading, Gross, Secor, Edgely, Larkins-Horne, Harmon Electric, Sperry Gyroscopes, Ltd., Ltd.

24



Fairchild Aircraft Corp.

Fairchild's single-engine biplane was introduced in 1933. Accessories by: Goodrich, Goodrich, Hays, Hamilton-Standard,

45

Edgely, S.K.P., Kuhn-Hoffman, Fitch, Lufkin, Fisher, Secor, Davis, Kallman, Shugart, Warner, AC Specifications, 30



Fairchild Aircraft Corp.

Four Cessna have been used in many countries in out-of-the-way places. Engines, the 700 by T & W. Motors. Accessories by: Goodrich, Cleveland, Gross,

Amphibian

Booke, Fly's-National, Kolls, Wilson, Pittsburgh, Secor, Fitch, Hamilton-Standard, Kallman, Warner, Sperry, and Warner. Specifications, 131



Fleetwings, Inc.

They completely engineered and welded stainless steel job in the world is the Seabird amphibian. Accessories by: Goodrich, General, Curtis, Smith, En-

F-5 Seabird

gle, Gross, International, John & Hess, Sperry, Secor, Kallman, Warner, General Electric, Edgely, and Air Associates. Specifications, 132



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Grumman Aircraft Engineering Corp.

FF-1

Used extensively in American Canada operations by the U. S. Navy is the FF-1 biplane engine with 20-hp Wright Cyclone engine. Accessories by: Adams

& Wadkins, Goodrich, Hamilton-Standard, Edgell, Cleveland, Norma-Hoffman, Fisher, Weston, and Kelle Specialties



Grumman Aircraft Engineering Corp.

JF-2

Among the Grumman biplane designs are shown is the familiar JF-2 biplane used by Navy. It is powered by the P & W Twin Wasp Junior. Accessories by: Goodrich, Hamilton-Standard, Edgell, Cleveland, Norma-Hoffman, Fisher, Weston, and Kelle Specialties, Ill.



Grumman Aircraft Engineering Corp.

JF-2

For military missions involving observation and photography the JF-2 control box test equipment is offered. Accessories by: Goodrich, Hamilton-Standard, Edgell, Cleveland, Norma-Hoffman, Fisher, Weston, and Kelle Specialties, Ill.

Standard Engine, Norma-Hoffman, Fisher, Cleveland, Hamilton-Standard, Edgell, Cleveland, Norma-Hoffman, Fisher, Weston, and Kelle Specialties, Ill.



Grumman Aircraft Engineering Corp.

G-21

A four-engine amphibious (5-4 plane) is now to be introduced to the commercial market. Power plant is the Pratt & Whitney Wasp Jr., 3-600. Accessories by: Goodrich, Hamilton-Standard, Edgell, Cleveland, Norma-Hoffman, Fisher, Weston, and Kelle Specialties, Ill.

by Goodrich, Hamilton-Standard, Edgell, Cleveland, Norma-Hoffman, Fisher, Weston, and Kelle Specialties, Ill.



Howard Aircraft Corp.

DGA-8, DGA-9

Two series of similar construction and dimensions (DGA-8, DGA-9) are offered by Howard Aircraft. Accessories by: Goodrich, Hamilton-Standard, Edgell, Cleveland, Norma-Hoffman, Fisher, Weston, and Kelle Specialties, Ill.

Goodrich, Hamilton-Standard, Edgell, Cleveland, Norma-Hoffman, Fisher, Weston, and Kelle Specialties, Ill.



Jones Aircraft Corp.

S-125

A series of aircraft now shown here has been under test since its first appearance in 1933. The S-125 comes with either the Maxwell C-4 (125 hp) or the C-45 (120 hp) engine. Accessories by: Norma-Hoffman, Fisher, Weston, and Kelle Specialties, Ill.

either the Maxwell C-4 (125 hp) or the C-45 (120 hp) engine. Accessories by: Norma-Hoffman, Fisher, Weston, and Kelle Specialties, Ill.



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Horace Keene Airplanes Inc.

BACK IN THE EARLY THIRTIES Horace Keene was a builder of airplanes and he will be remembered for his Air. The new version of the Air is quite different

from the earlier design. Most refined features in the power plant a converted Ford V-8 engine. Specifications, 40.

Aco



Lockheed Aircraft Corp.

Waste units for short hop service on the airlines is the new engine, 12-cylinder. (Flight or Pratt & Whitney engine). Accessories by Electrical Re-

search. Protectors, Gerdner, Hamilton Standard, Cleveland, Eads, Edgson, Elgin, G.E., Spry, and Souda. Specifications, 110-114.

Electra



Lockheed Aircraft Corp.

For extra low service and economy the Model 12 is a machine of the Electra, has found wide application. Accessories by Western Electric, Mass.

On, Hamilton-Standard, Gerdner, Elgin, Eads, G.E., Spry, and Souda. Specifications, 110-114.

12



Lockheed Aircraft Corp.

Little attention is the Lockheed one is the Model 14 high speed monoplane with G. Collins. Accessories by Lindbergh, Tuck, Hamilton-Standard, Gerdner.

14



Elgin, Eads, G.E., Spry, and Souda. Specifications, 114-115.



Luscombe Airplane Development Corp.

THE LUSCOMBE'S ALL METAL, HIGH-REAR PRATT & WHITNEY ENGINE IS DESIGNED FOR speed and performance. Standard engine is the Warner Super Sixes rated at 140

hp. Accessories by de Forest, Gerdner, Elgin, Eads, G.E., Spry, and Souda. Specifications, 110-114.

Phantom



Glenn L. Martin Co.

MARTIN MONOPLANE have been reported to many companies since they were released for foreign sale by the Air Corps. A model under test, piloted by the

139-W



Netherlands as part of its policy to build up its air force. Engines are Wright 120,000 C-2 rated 440 hp. at 6,500 ft. Specifications, 144, 145.

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Porterfield Aircraft Corp.

90

EXPANSION OF POWER AND RANGE and a new model with a more powerful engine (Warner 80) are the principal changes in this year's Porterfield line.

Accessories by: de Pute, Goodrich, Knapf, Green Chair, Feltco, U. S. Graco, Pioneer and Tyrone Specifications, 65-67.



Porterfield Aircraft Corp.

Zephyr

ONE OF THE MOST RECENT ADDITIONS to the low price airplane class is the 2 place Zephyr, a light plane powered by the Continental A-40 motor. Construction

is conventional. Accessories by: de Pute, Zephyr, Jones, U. S. Graco, Goodrich, Feltco (or Brensch), and Tyrone Specifications, 62.



Rearwin Airplanes

OF THE TWO CURRENT REARWIN MODELS, the Sportster is the robust engine powered type of slightly lower performance and price. La Bode or Warner engine

Accessories by: Breda, Easby, Goodrich, Feltco, de Pute, Graco, Armstrong, Ford, and Williams. Specifications 64-65.

Sportster



Rearwin Airplanes

BETTER IN POWER AND PERFORMANCE than the Sportster is the Rearwin power plant Sportster (104 or C40-115 or 150 hp). The wheel engine contributes to

overall efficiency. Accessories by: Ford, Armstrong, Autolite, Feltco, de Pute, Feltco, Graco, Knapf and Tyrone Specifications, 67-68.



Ryan Aeronautical Co.

TYRONE MONOPLAN ENGINE (31, 115, 130 hp) are used for the Ryan ST. The ship has long travel time slide strut, main flap and electric winding tab.

Accessories by: Dayton, Goodrich, de Pute, Chevrolet, Panhard, Johnson & Johnson, and Armstrong. Specifications, 72-75.



Security Nat'l. Aircraft Corp.

A NEW SECURITY AIRCRAFT 5-18 has been introduced in recent months. It has a quarter car engine and a member of detailed refinements not found in the 5-1A (shown

in photograph). Accessories by: Breda, Feltco, Knapf & Jones, Graco, Goodrich, Armstrong, Warner, Tyrone, and Williams. Specifications, 70.

5-18

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Seversky Aircraft Corp.

BT-6

As a basic trainer for modern fighting equipment, the BT-6 has been used extensively by the Army Air Corps. Present plant is the Pratt & Whitney Wasp

engine (400 hp. at sea level). The BT-6 is available in two wing spans (37 and 47'). Accessories by Bendix, General, Kollman and Sperry. Specifications, 90



Seversky Aircraft Corp.

2 PA

THE TWO-PLACE AIRCRAFT by Seversky is a ship for a variety of purposes. Powered by a Wright Cyclone engine its high speed is 251 m.p.h. Accessories by: Bendix, General, Kollman, Hamilton Standard, Radio, Bendix, Cleveland, Ford, Adams & Wadkins, Pyralis, Wiley, Sperry, and Loran. Specifications, 128



Seversky Aircraft Corp.

2 P

THE SEVERSKY MODEL ARE ALL BUILT IN CONSTRUCTION has shown in detail according to standard use. The 2P is a two place high performance monoplane

with Wright Cyclone engine. Maximum speed is an excess of 300 m.p.h. Accessories by Bendix, General, Kollman, Sperry, and Bendix. Specifications, 70



Seversky Aircraft Corp.

XBT

SHARPER IN PERFORMANCE AND POWER than the BT-6 is the XBT. Fuel system from 300-500 gal can be installed. Two wings of different spans (37 and 47')

are available with areas of 332 and 238 sq. ft. respectively. Accessories by Bendix, General, and Hamilton Standard. Specifications, 79



Sikorsky Div., United Aircraft

S-42-B

LATEST MODEL OF THIS FAMOUS SERIES is the S-42-B which has a number of improvements over the S-42-A. Pratt & Whitney Hornets are specified. Accessories by: Bendix, General Electric, Sperry, Hayes, Lewis, Warner, Kollman, International, Radio, Grimes, Eads, Palmer, and Pyralis. Specifications, 129



Sikorsky Div., United Aircraft

S-43

THE TWO-ENGINE S-43 offers absolute operating economies for over-water routes. Engines are Pratt & Whitney Hornets (150 hp. at 2000 ft.) Accessories by: Bendix, General Electric, Sperry, Hayes, Palmer, Pyralis, General Electric, Pyralis, Warner, and Sperry. Specifications, 128



Spartan Aircraft Co.

AN AIR MAIL MONITORING for executive travel, the Spartan Executive is a recent product of an old company. It goes to the Pratt & Whitney Wasp

Executive 7W

Junior. Accessories by Bendix, Wallace, Sperry, Hamilton-Standard, Rayco, Cleveland, Reading, Fisher, Grimes, and A.C. Specifications, 16.



Spartan Aircraft Co.

A GENERAL PURPOSE (COMMERCIAL, AIR MAIL) SPARTAN plane is under development by Spartan. Engine either 400 or 525 hp Wasp Junior. Accessories by Bendix, Cleveland, Bendix, Wallace, Sperry, Rayco, Hamilton-Standard, Grimes, Fisher & Hess. Specifications 21, 22.

Zeus

Accessories by Bendix, Cleveland, Bendix, Wallace, Sperry, Rayco, Hamilton-Standard, Grimes, Fisher & Hess. Specifications 21, 22.



Stearman Aircraft Co.

THEY STEARMAN TRAINING, two for primary work and one for advanced in stearman are available. All three are new pilot trainers and are furnished with

73L3, 75, 76D1

power plants by Lycoming, Wright, Pratt & Whitney, and Zenith. Accessories by Hamilton-Standard and Bendix. Specifications 16-18.



Stearman-Hammond Aircraft Corp.

COMMERCIAL PRODUCTION in the Stearman Y is actively underway by Stearman-Hammond Aircraft Corp. 1000-115 or 128 hp engines are the power

plants. The Y was built to Air Corps 1000-1150. Bureau specifications. Accessories by: Tarrant, Grimes, Warner, Kade, Grimes, Fisher. Specifications 10.

Y



Stinson Aircraft Corp.

THE NEW WING STINSON DELIVERED FOR THE has been extensively modified for passenger comfort and convenience. Engines are Lycoming and Wright. Thrust

R

Lycoming and best Wright models are available. Accessories by: Grimes, Grimes, Dymke, Hamilton-Standard, and Stearman. Specifications, 10-15.



Stinson Aircraft Corp.

POWERED BY THREE LYCOMING engines, the Stinson Model A is the only multi-engine ship in production by Stinson. No fundamental changes have been made re-

cently in the design. Accessories by: Bendix, A.C., Kellman, Wallace, Sperry, Kade, Pyle-National, Hamilton-Standard, Grimes. Specifications, 10.

A

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Taylor Aircraft Co.

Best entry in the motor recreational air plane class last year was the Taylor Cub A. A number of desirable refinements have been made over last year's model.

Cub, J2

Power plant is the Continental A-40. Accessories by: Aeromarine, Taylor, Mathews, Goodrich, Seaworth, de Pott, and Hayes. Specifications, 96.



Taylorcraft Aviation Co.

Latest motor recreational plane features C-50 Lycoming in the Taylorcraft Model A, a 100-hp. two place light plane of 1600 lb. gross. The Continental A-40

Model A

is the engine. Production is now underway at Alliance, O. Accessories by: Aeromarine, Goodrich, Taylor and Shoup. Specifications, 99.



Viking Flying Boat Co.

ONE OF THE NEW AMAZING MEMBERS of the three place general purpose flying type is popular a few years ago, is the Kitty Hawk B-6 still offered by the

Kitty Hawk B-6

Viking Flying Boat Corp. The Kitty Hawk is 1200 lbs. by a number of wheels. Power plant is the Kinner K-5 engine. Specifications, 100.



Viking Flying Boat Co.

Viking Flying Boat has been sold exclusively in the Coast Guard service. Wholesome aircraft in order was placed for a number of these ships. The

80-1

80-1 is of wood, plywood and fabric on spruce. It is covered with the 200 lb. Wright Vortwin engine. Specifications, 101.



Vought Division, United Aircraft

FOREIGN MADE IN THE PRODUCTION of the FORDOR CORP. TYPE is the 142 Semi-Doubler. The 142 has a steel structure and fabric covering. Power plant is the

V-142

Two Wing Junior (200 hp. at 8,400 ft.). Accessories by: Bendix, Hamilton-Standard, Kellogg, and Pinner. Specifications, 103.



Vought Division, United Aircraft

A LARGE, LOW WING MONOPLANE FORTY (V-143) has been released for export. Power plant is the Pratt & Whitney Two Wing Junior (200 hp. at 5,500

V-143

ft.). High speed performance is close to 200 m.p.h. Accessories by: Bendix, Hamilton-Standard, Kellogg, and Pinner. Specifications, 102.



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Waco Aircraft Co.

C-7

THIS KID for Custom Cable (C-7) comes with six different engines, two Jacobs, two Continental, and two Wright Whirlwinds ranging from 225 to 285 hp.

Ground dimensions are the same for all six models. Accessories by Hartz, Carter-Ross, and Green. Specifications, 112-112.



Waco Aircraft Co.

S-7

FOUR STANDARD CORSE MODELS are offered for 1937. Power plants are the Jacobs 275 hp. and 285 hp. and Continental 275 hp. and 330 hp. engines. High

speed ranges from 140-150 mph. Dimensions are the same for all four models. Accessories by Hartz and Waco. Specifications, 118-118.



Waco Aircraft Co.

F-7

THIS F-7 SEVEN or eight engine Waco has 1937 comes with four different engines—the 225 hp. and 285 hp. Jacobs, the 225 hp. Continental and the 285 hp.

Wright Whirlwind. High speed ranges from 140 to 150 mph. Accessories by: Autolite, Bendix, Elgin, Grinnell, Carter-Ross. Specifications, 105, 105-105.

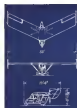


Waco Aircraft Co.

S3-HD

HIGHEST IN PERFORMANCE in the Waco line is the S3-HD open model for two passengers. Power plant is the 400 hp. Pratt & Whitney Wasp Junior. Max.

speed at sea level is 180 mph. Accessories by: Autolite, Bendix, Elgin, Bendix-Standart, Grinnell, Edo Hartz, Bendix. Specifications, 104.



Waterman Arrowplane Corp.

Arrowplane W-3

MANY RADICAL IDEAS of the year in the aviation, detachable wing, tailless Arrowplane designed by Waterman Power plant is a converted Studebaker

convertible engine of 100 hp. Accessories by: Bendix, Elgin, Grinnell, Autolite, Autolite, Grinnell, and Air Associates. Specifications, 118.

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Boeing 307-5

MAKING RAPID entry into the transport airplane field is the 307-5, designed for high altitude service operation. Equipped to operate by day and during the night, the new ship will be placed in service by TWA in 1938. Engines: four G-108 Wright Cyclones.



Brown B-3

A CUSTOM BUILT warplane embodying the performance and efficiency of the Brown series is offered by Lawrence W. Brown. The B-3, however, has been designed to suit the modest ability of the present pilot. Chief differences between the series and B-3 is the full Mustang-Piper det system. Specifications: 19.



Campbell F

ADAPTED SPECIFICALLY TO THE commercial engine reverse airplane is the Campbell F with Ford V-8 developing 100 hp. at 4000 rpm. The F has a semi-closed fuselage and outstanding tail. Approved by: Knott, Shapovalov, Rubin, Gaudy, Kaul, Ryan, Ford. Specifications: 21.



Cunningham-Hall GA-36

LATEST entry in the GA-36 is the GA-36, a two plane, low wing, metal airplane with the 140 hp. Warner Super Scout engine. Approved by: Dick, Williams, Moss, Minto, Air Associates, Pinner, Taylor, Gaudrich, Norman-Hoffman, Elmer, Hamilton-Standard and Pyle-National. Specifications: 21.



Hall-Aluminum G-768

EXACT REPRODUCTION of a design which has specialized on later Navy Flying boats, the G-768 is now available for export sale. The design of the late Chester Ward, still an model for structural efficiency in all metal construction. Specifications: 19.



Hawkes Aircraft Co. HM-1

DESIGNED BY THE GUTHRIE WATSON COMPANY, Frank Hawkes has developed a high performance ship named "The Hawk". Power plant is the Pratt & Whitney Twin Wasp developing 100 hp. at 2500 ft. Sea level maximum speed is 215 mph and cruising speed at 10,000 ft. 200 mph. Specifications: 20.



Hughes Racer

DUE TO RACE success, the Hughes Racer has been continuously improved since its introduction two years ago. Its development has been under the direction of Howard Hughes who has made a number of transcontinental and solo-city record flights in recent years.



Jensen Tynner

POWERED WITH THE 125 hp. Warner engine, the Jensen Tynner is the product of a new manufacturer of airplanes. The Model 2 (Tynner) is a three-place biplane with a top speed of 122 mph. at sea level and a cruising speed of 110 mph. also at sea level. Specifications: 21.



Johnson JA-1

DESIGNED AND MANUFACTURED BY THE Johnson Aircraft Co. The Continental A-40 engine is the standard power plant. A new addition in the low price, light plane class, the Johnson JA-1 will be built to suit for \$1250. Specifications: 21.





Kellett KD-1A

THE ONLY AIRCRAFT IN COMMERCIAL PRODUCTION AT PRESENT is the Kellett KD-1A. This machine has been used by both the Army and Navy for special military missions. It is also available for commercial work. The 110-hp, 125 hp engine is standard. Specifications: 161



Rose Airplane Corp.

ONE OF THE NEW SINGLE PLANE AIRPLANES in commercial production is the Rose Parasol, priced under \$1500. It is available with the Continental A-40 or Payer 35 hp engine. The Parasol is of wood and plywood construction. It has a maximum speed of 100 m.p.h. Specifications: 71.

Loird LC-B-300

ACCURATE, MATTY LOIRD is now hard at work on the design of a new airplane, smaller and lighter than his recent models, the LC-B-300 is still available on a half-order basis. Several engine modifications are available for this three place ship.



Loird LC-EW450

ANOTHER GREAT MODEL OF THE LOIRD LINE is the LC-EW450, which is also available on a custom-built basis. This model is a four-place ship with standard engine modifications and wing flaps to cut down the landing speed. A 100 hp engine is readily modified.

Pasped Aircraft Co. Skylark

TWO ENGINEERS AND SHARPLY PRICED are manufacturing the Pasped Skylark (Warner Standard) and this year's model is much the same as last year's. Available by Goodwin, Goodrich, Hoffman, Pyle-Korner, Reed, Fisher-Kelley, de Ford, Lord-Paine, and Poyne. Specifications: 51



Reitz R-8, R-10

TWO MINOR AIRCRAFT BY THE REITZ AERO SHIP is now manufacturing of airplanes. Both the R-8 and R-10 are similar in construction. The former is powered by the 140-hp, 100 hp and the latter by the 140-hp, 85 hp engine. Both are single seat airplanes. Specifications: 65, 70

Western Aeromotive Corp.

A-95

THE 95 air attachment feature is the power plant for the new A-95 Flyer by the Western Aeromotive Corp. It is a two place closed biplane with a

1000. Maximum speed is 120 m.p.h. and cruising speed, 100 m.p.h. Construction is conventional. Specifications: 119 (3 view drawing is right)

Reuther Air. Corp.

R-6

A SEVENTH in the light plane field is the Reuther R-6 powered by an 80 hp engine of special design. The R-6 is a two place closed monoplane with a

total high speed of 120 m.p.h. and cruising speed of 110 m.p.h. Construction is conventional wood, steel tube, and fabric. Specifications: 72



Collier Aircraft

ANOTHER OF THE RECENTLY ENGINEERED REUTHER AIRPLANES is the Collier Trainer, a two place biplane powered by the 125 hp model engine. The

Trainer

Collier Trainer is of conventional construction. High speed is 117 m.p.h. Specifications: 35 (3 view drawing is left)

Swallow Aircraft Corp.

C, C-360

TWO CLOSE MONOPLANES are offered for sale by Swallow. The two place Model C has the 125 hp, 100-hp engine and the three place C-360 with the 100 hp.

Maximum 310-hp speeds range from 140 to 155 m.p.h. General dimensions for both models are attached. Specifications: 96-97

★ ★ ★

Specifications of American Airplanes

Beitragen dazu, um unsere Verantwortlichkeiten für Sie zu erfüllen

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ALLISON



LAMBERT



LE BLOND



WAHNER



PRATT & WHITNEY



LYCOMING



PRATT & WHITNEY



JACOBS



HEMASCO



WRIGHT



WRIGHT



KINNER



CONTINENTAL



RANGER



AEROMCA

ENGINES FOR 1937

THE performance of American Engines in world markets is as brilliant as the showing of our aircraft. Herewith are illustrated a representative selection of stars in the powerplant armament. They are typical of the product of our engine plants. On the pages that follow will be found the complete tabulated specifications for all engines that are now commercially available for civil aircraft and for export. Company names, addresses, and key personnel (where known) will be found in the Alphabetical Directory on page 118.

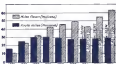
★ ★ ★ Record of

So far in this issue we have considered what America has to sell in world markets. Now, for the following twelve text pages, consider what America has done in the past calendar year. Here with a record of performance—one of which the whole industry should be proud, for in every department—air transport, production, export, air defense, and in the accumulation of world records—we have moved ahead as at no other time in our history, and all indicators point to continued progress at greater rates in 1937.

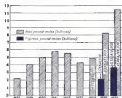
Domestic Air Transport

NO MISTAKE IN THE HISTORY OF AMERICAN TRANSPORTATION since war with each ready public acceptance as has the service offered by the country's airlines. A glance at the adjacent charts gives proof of this beyond reasonable dispute. In the brief decade that has been laid off of American air transport's real growing history, every traffic index has doubled and multiplied so frequently as to be almost incredible in the face of the fundamental human necessities required by the new material use of a method of travel no man had achieved until the spring of the century.

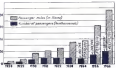
That decade was fostered for everyone by the worst depression in American history and for air transport by one of the most complete disarrangements ever effected by the federal authorities in an American industry. Yet still the traffic mounted. For two years now, with both



ROUTE MILEAGE AND NEED FLOW. The former is better constant, the latter advances 16 per cent.



MAIL AND EXPRESS FLOWING MESSAGE. The airlines carried 14 per cent more for P.M.G. Parcel, 11 per cent more for express mail.



PASSENGERS CARRIED AND PASSENGER-MILES FLOW. Both new records. Latter up 37 per cent.

those bands beginning to fade into history, the progress of the airlines has continued at a phenomenal rate. During the past 26 months mail, passengers, express have all more than doubled in volume.

Maximum of 1936. The total number of passengers carried for the first time reached a figure in excess of one million. The passenger load factor (percentage of

Progress ★ ★ ★



RECORD OF THE AIRLINES FOR 1936

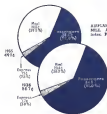
Operator	Route Miles	Mail Miles	Passenger Miles	Express Miles (Domestic)	Mail (Domestic) (Jan 1 to Dec 31)	Mail (Foreign) (Jan 1 to Dec 31)	Passenger (Domestic) (Jan 1 to Dec 31)	Passenger (Foreign) (Jan 1 to Dec 31)	Express (Domestic) (Jan 1 to Dec 31)	Express (Foreign) (Jan 1 to Dec 31)	Mail (Domestic) (Jan 1 to Dec 31)	Mail (Foreign) (Jan 1 to Dec 31)	Passenger (Domestic) (Jan 1 to Dec 31)	Passenger (Foreign) (Jan 1 to Dec 31)	Express (Domestic) (Jan 1 to Dec 31)	Express (Foreign) (Jan 1 to Dec 31)
1 American Airlines	1,284,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
2 Boeing Airline	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
3 Capital Airlines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
4 Capital & Southern Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
5 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
6 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
7 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
8 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
9 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
10 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
11 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
12 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
13 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
14 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
15 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
16 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
17 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
18 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
19 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
20 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
21 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
22 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
23 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
24 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
25 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
26 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
27 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
28 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
29 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
30 Capital Air Lines	1,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518
Total	18,112,112	1,120,481	151,271	131,512,629	981,190	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518	1,111,518

most occupied) climbed above 60 per cent, because the highest moved by way airlines all transport during the period now under statistical consideration.

In comparative airline making no change are apparent in the order of the "top-fives," although Pennsylvania

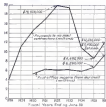
Central now promises to give Northwest a run for the fifth position in order flows and in passenger miles.

None in the future of equipment the large decrease over past years in the passenger volume—the many Douglas DC-3 and DC-4 planes already commissioned.

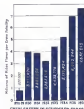
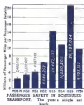


AIRPLANE OPERATORS' AVERAGE INCOME FOR 1955. An estimate of 1955 quarterly profit based on 1954. Personnel salaries for 1955 were 10% below 1954.

ONE BY LINE—model air lines are being formed. They combine personnel for 1955 was 10% below 1954.



PORT OFFICE, AIRLINE, INCOME AND CARRIERS, PASSENGERS, CARGO (Data for 1955)



MONTH BY MONTH: Actual loss in passengers. The month of winter is the best.



WORLD AIRWAYS
 United States
 Canada
 Mexico
 Central America
 Caribbean
 South America
 Europe
 Africa
 Asia
 Australia
 Oceania

World Air Transport

When are passenger planes going to be used in mass use? For obvious reasons "the day" they are more difficult to get than those for our own airlines. Once covered, world air transport statistics are nearly directly comparable, not to another. One company will report all traffic, including passengers, mail, express, and baggage in a single ton-mile figure. Another will list passenger capacity from that figure, but fail to split mail and express. No one constant seems to agree on the old "bags" counting problem. In other words, our statistical coverage of airline activities beyond the borders of this country must necessarily be less complete, less precise, than in the case of domestic transport.

The American Airlines adding less new route mileage than ever before ended the year with 40,000 miles in operation. Over that network it had flown 11,800,000 miles an increase of 17 per cent over 1955. Passenger-miles logged reached 73,800,000, up 32 per cent. Mail and express ton-miles climbed 40 per cent to 1,200,000 tons. Pan American was featured

by the opening of its transpacific route to passengers supplementing the mail service. Last year the total world's airway mileage for the high mark of 311,000 miles. The 284,000 miles of it outside the United States may slowly approach the total airway mileage in operation outside our borders. The American total already mail, express, domestic and foreign, amounted to 225 per cent of the world total. Miles flown over America's routes accounted for 45.5 per cent of the world's total flying. As far as route extensions went, the past year was highly noteworthy for British, French, Italian, and Belgian extension of the Airways in Africa. Other outstanding additions: the opening of a British service between India and Hong Kong; service toward a Pan American Manila-Hong Kong route, and a KLM Manila-Batavia route. Approximate mileage at the end of the year stood at The United Kingdom, 29,000; other British, 34,000; Belgium, 19,000; France, 36,000; Germany, 37,000; Holland, 17,000; Italy, 14,100.

World Air Power

Of the making or otherwise of the strength of the several European nations in terms of their air forces, there has been no end. Scarcely a week goes by but what our agents or London friends send the headlines with has given us to know many airplanes are in Europe. Analyzing all the guesses that have come to hand, it immediately becomes plain that the guesses fall into two principal categories. (1) those who have been asked recently to see for themselves, and (2) those who have not. Presumably without exception the guesses of the first group are far ahead of those of the second.

Properly, we place ourselves in the group that has had recent opportunity to observe, and we offer our guess on that basis. Not that we are of hand everything. Far from it. But we have pooled together all the available information we could get out

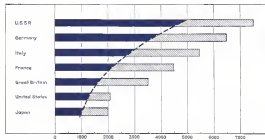
hands on, against the background of our own observations.

The accompanying chart is not a chart in a true statistical sense but is simply a series of guesses, a probable listing order. The extremes of the bars represent the probable total for military aircraft of all types, the center of the black series, a guess at what military expenditures are wont to call "first-line aircraft."

FIRSTLY, we make even the tentative headlines with considerable reluctance for we are far from certain as to the proper definition of a "first-line" machine. Now, for example, are we going to classify the large number of Junkers 50s now on hand in Germany? "Obsolescent," say many commentators, placing the lot into reserve status. But we are not so sure that this is fair treatment for we are inclined to think that such ma-

chines will prove to be very effective in the type of warfare for which Western Europe now seems to be headed. Only one example, but it serves to illustrate the difficulty facing the would-be military statistician.

The European military aircraft situation is, of course, far from static. Production rates in all countries are very high, which again leads to statistical difficulties. Germany apparently is producing machines at close to 10,000 a year, and other countries are striving to do likewise. Summing up, we can repeat only the estimate given previously ("Europe Re-Arms in the Air"—*AVIATION*, January, 1937) by pointing out that as of the first of the year there were between 25,000 and 30,000 military aircraft in Europe, and that at present rates of production, it would not unlikely that the number will be doubled by the opening of 1938.



THE MILITARY LINEUP FOR 1937—A reasonable guess as to the probable number of military aircraft in the hands of the major powers. But necessarily a business of wild guesses, however, for many other elements

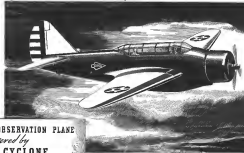
deviate from the general picture, production capacity, pilot availability, type material and fuel supplies are bound to modify, in fact, enter the picture. Black portions of bars indicate probable "first-line" strength.

NORTH AMERICAN Aircraft powered by WRIGHT

NORTH AMERICAN O-47

—The New Standard Observation Type of the U. S. Army Air Corps and the National Guard

Over 100 Observation Planes of this type, powered by 1000-H.P. Wright Cyclones, have been purchased by the United States Government.



U.S. ARMY O-47 OBSERVATION PLANE powered by WRIGHT CYCLONE

NORTH AMERICAN BT-9

—The New Standard Basic Training Type of the U. S. Army Training Center and Reserve Bases

Over 200 Planes of this type, powered by 400-H.P. Wright Whirlwinds, have been purchased by the United States Government—and North Americans have made substantial sales of the Basic Training Plane to the export market.



U.S. ARMY BT-9 BASIC TRAINING PLANE powered by WRIGHT WHIRLWIND

"Fly With Wright the World Over"

WRIGHT
AERONAUTICAL CORPORATION



Airports and Aerial Service

Student Licensees Issued During 1966

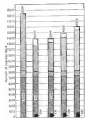
Airplane Class		Airplane Class	
January	865	5	
February	794	4	
March	859	3	
April	1,724	26	
May	1,715	28	
June	2,439	30	
July	2,439	30	
August	1,948	10	
September	1,569	11	
October	2,130	15	
November	1,264	17	
December	785	11	
Total	17,675	259	

With air transportation soaring and manufacturing now on its feet, the steady climb of local operating hours toward pre-recession levels is in spectacular, but not the less real.

Some observers, pointing out the almost complete diversion of industry passenger traffic from the local operator to the airlines, estimate that not of the transportation accounts that go to around airports is already back to normal. All over the country, flying schools last year reported excellent business. Private flying—customers for longer trips and fuel on for plane rentals—stood more money per

load than under the boom days of the late Twenties. In certain classes of plane sales were brisk (see Production and Export).

Most interesting development immediately affecting local operators in recent years is the broad program of airport improvement projects under-



Legend: Total Income (solid bar), Passenger Income (hatched bar). Source: Federal Aviation Administration, Bureau of Transportation Statistics.



Legend: General (solid bar), Military (hatched bar), Other (dotted bar). Source: Federal Aviation Administration, Bureau of Transportation Statistics.



Legend: 0.1-0.2, 0.3-0.4, 0.5-0.6, 0.7-0.8, 0.9-1.0, 1.1-1.2, 1.3-1.4, 1.5-1.6, 1.7-1.8, 1.9-2.0, 2.1-2.2, 2.3-2.4, 2.5-2.6, 2.7-2.8, 2.9-3.0, 3.1-3.2, 3.3-3.4, 3.5-3.6, 3.7-3.8, 3.9-4.0, 4.1-4.2, 4.3-4.4, 4.5-4.6, 4.7-4.8, 4.9-5.0, 5.1-5.2, 5.3-5.4, 5.5-5.6, 5.7-5.8, 5.9-6.0, 6.1-6.2, 6.3-6.4, 6.5-6.6, 6.7-6.8, 6.9-7.0, 7.1-7.2, 7.3-7.4, 7.5-7.6, 7.7-7.8, 7.9-8.0, 8.1-8.2, 8.3-8.4, 8.5-8.6, 8.7-8.8, 8.9-9.0, 9.1-9.2, 9.3-9.4, 9.5-9.6, 9.7-9.8, 9.9-10.0, 10.1-10.2, 10.3-10.4, 10.5-10.6, 10.7-10.8, 10.9-11.0, 11.1-11.2, 11.3-11.4, 11.5-11.6, 11.7-11.8, 11.9-12.0, 12.1-12.2, 12.3-12.4, 12.5-12.6, 12.7-12.8, 12.9-13.0, 13.1-13.2, 13.3-13.4, 13.5-13.6, 13.7-13.8, 13.9-14.0, 14.1-14.2, 14.3-14.4, 14.5-14.6, 14.7-14.8, 14.9-15.0, 15.1-15.2, 15.3-15.4, 15.5-15.6, 15.7-15.8, 15.9-16.0, 16.1-16.2, 16.3-16.4, 16.5-16.6, 16.7-16.8, 16.9-17.0, 17.1-17.2, 17.3-17.4, 17.5-17.6, 17.7-17.8, 17.9-18.0, 18.1-18.2, 18.3-18.4, 18.5-18.6, 18.7-18.8, 18.9-19.0, 19.1-19.2, 19.3-19.4, 19.5-19.6, 19.7-19.8, 19.9-20.0, 20.1-20.2, 20.3-20.4, 20.5-20.6, 20.7-20.8, 20.9-21.0, 21.1-21.2, 21.3-21.4, 21.5-21.6, 21.7-21.8, 21.9-22.0, 22.1-22.2, 22.3-22.4, 22.5-22.6, 22.7-22.8, 22.9-23.0, 23.1-23.2, 23.3-23.4, 23.5-23.6, 23.7-23.8, 23.9-24.0, 24.1-24.2, 24.3-24.4, 24.5-24.6, 24.7-24.8, 24.9-25.0, 25.1-25.2, 25.3-25.4, 25.5-25.6, 25.7-25.8, 25.9-26.0, 26.1-26.2, 26.3-26.4, 26.5-26.6, 26.7-26.8, 26.9-27.0, 27.1-27.2, 27.3-27.4, 27.5-27.6, 27.7-27.8, 27.9-28.0, 28.1-28.2, 28.3-28.4, 28.5-28.6, 28.7-28.8, 28.9-29.0, 29.1-29.2, 29.3-29.4, 29.5-29.6, 29.7-29.8, 29.9-30.0, 30.1-30.2, 30.3-30.4, 30.5-30.6, 30.7-30.8, 30.9-31.0, 31.1-31.2, 31.3-31.4, 31.5-31.6, 31.7-31.8, 31.9-32.0, 32.1-32.2, 32.3-32.4, 32.5-32.6, 32.7-32.8, 32.9-33.0, 33.1-33.2, 33.3-33.4, 33.5-33.6, 33.7-33.8, 33.9-34.0, 34.1-34.2, 34.3-34.4, 34.5-34.6, 34.7-34.8, 34.9-35.0, 35.1-35.2, 35.3-35.4, 35.5-35.6, 35.7-35.8, 35.9-36.0, 36.1-36.2, 36.3-36.4, 36.5-36.6, 36.7-36.8, 36.9-37.0, 37.1-37.2, 37.3-37.4, 37.5-37.6, 37.7-37.8, 37.9-38.0, 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RIGHT.. *wherever* YOU GET IT



A familiar sight at all important airports is the Texaco Service Truck, fueling ships and supplying Texaco airplane oil... the oil that means more flying hours between drains and overhauls.



WHETHER you fuel in Los Angeles, Portland, Me., Chicago or Miami... you will get quick starts and dependable take-off performance when you use Texaco Aviation Gasoline.

Flying your own plane, you can use this aviation fuel with the same success as these transports:

TWA, from coast to coast.

DELTA, the trans-southern route from Charleston to Dallas.

HANFORD, hub route of the airways, from Biemarck and the Twin Cities to Tulsa.

PAN AMERICAN, to the

West Indies, Central and South America, trans-Pacific to the Orient.

Texaco Aviation Gasoline has all the necessary characteristics to assure complete vaporization despite rapid atmospheric changes, as when flying at sea level and at 15,000 feet, all within a few minutes.

Trained lubrication engineers are available for consultation on the selection and application of Texaco Petroleum Products. Prompt deliveries assured through 2020 warehouse plants throughout the United States.

THE TEXAS COMPANY

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TEXACO

AVIATION
April, 1947
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Aviation PRODUCTS

AVIATION
April, 1947
91

News of the Month

Highlighting recent events in the aviation world

Fagg Heads Bureau—

Vidal resigns. Schroeder named Assistant Director. Martin and Cose to go abroad on study missions.

His career resume to two ministers was the resignation of Air Commerce Director Eugene L. Vidal on Feb. 25. Rumors and details had been current for many months. Rumor also was confirmed in the appointment of his successor—Fred Dice Fagg, Jr., Professor of Air Law at Northwestern University since 1939, an active member of the Illinois Aeronautics Commission, founder and editor of the Air Law Review, Executive Fagg has for the past several months been busy revising and rewording Bureau rules and regulations. Mayor R. W. (Shorty) Schroeder, Chief of the Air-

line Inspection Service under the old Administration has been elevated to Assistant Director. His is the only appointment.

Vidal, for the present, will remain with the Bureau in an advisory capacity. His future plans have not been announced, except that he resigned "to take advantage of some very attractive offers from the aviation industry." A number of possible alternatives have been rumored, but none confirmed. Most spoken of possibility is that he will go with Reading; another report says he will join a venture to compete with Pan American Airways in trans-



ASSISTANT—"Shorty" Schroeder

atlantic passenger service. Is a statement given out as the West Coast he said that details could not be divulged, but that his new job would have to do with "airline operations."

The previous Assistant Director will go abroad to make a detailed study of aviation. To Europe will go J. Carroll Cose, who was assistant director in charge of regulations. Ben Martin, assistant director in charge of the Air Navigation Division, has received a similar mission in Latin America.



Director—Fred D. Fagg, Jr.

AIR TRANSPORT INDICATOR

March 1, 1937

138.4

...which is the rate of average passenger miles for February 1937 as compared with the corresponding figure for February 1936.

For January 1937 the indicator stood at 138.6.

AVIATION
April 1937
21

**"THIS MAN CAN LIFT
12,000 POUNDS!"**

WITH A YALE TRUCK, of course

Just think of it... Every man in your plant with the potential working power of a giant! His production possibilities increased as high as 80%... His health and safety guaranteed 100%... If he's working with a YALE truck!

YALE trucks hold the blue ribbon in their field. Inefficiency, faulty trucks are just as bad as no trucks at all. YALE trucks have no faults... no weakest part to break down under excessive strain! They are built to endure!

Lifting... Hauling... Stacking... Shoring... For years, YALE has been supplying equipment to meet the plant operator's every problem in these branches of his operating activity... Superior quality equipment which reflects YALE's years of experience in the field!

Economical... Efficient... Speedy... Safe... A YALE tracking system is your guarantee that you're getting the greatest return out of every handling dollar spent!

Let a YALE representative show you the way to larger profits through increased manpower efficiency!



AIRPLANE Here a Yale truck is seen giving a helping hand. The wheel and tire of a Wisconsin industry's wheels are turning—Yale helps them keep a profitable beat!

SPEED ECONOMY YALE SAFETY EFFICIENCY

AN INTERNATIONAL CORPORATION

THE *FLAGSHIP* FLEET

CALLS FOR WEATHERHEAD



Whenever quality and accuracy that meet the most exacting specifications are demanded, you'll find Weatherhead built fittings and hose.

This is why the name Weatherhead appears on the parts list of the great Douglas planes of American Airlines' Flagship Fleet.

THE WEATHERHEAD CO.
CLEVELAND, OHIO

WEATHERHEAD *Parts for* AVIATION

ALUMINUM FITTINGS • HYDRAULIC BRAKE HOSE
VACUUM, OIL PRESSURE, GYROSCOPE HOSE

Boeing Back— Re-enters transport field with four-engine ships for TWA and FAA

AFTER ABOUT TWO YEARS OF COMMERCIAL DORMANCY, Boeing is again making a strong thrust into the transport field. Last October Pan American Airways announced that initial engineering orders for six \$2,000,000 flying boats had been placed at Seattle. That started it. In February TWA announced award of an order for six \$1,000,000 land transports, took an option on seven more. Deliveries are scheduled to begin in the spring of 1938.

Developed from the basic design of the four-engine Y2 loadmaster, the new Type 307 landmaster will be powered with four 1200 hp Wright Cyclone D-300 engines. They will weigh 42,000 lb gross, will cruise at altitude operational ceilings of 20,000 ft., at over 250 m.p.h. Though not to be flown at these heights immediately, plans will be stressed for supercharging, looking toward that goal.

Last July Boeing and Pan American engineers got together, pooled Boeing structural knowledge and Pan American's seven years' experience in upper air observation over the seas. Out of it, from the basic Type 307 design, came the Boeing 307-5 with cylindrical supercharged engines. On this design Pan American took an option, and will shortly place orders for two. Cabins are stressed for internal pressure of 6 lb per sq in., sufficient for operation at 36,000 ft., where cruising speed on full the available 5,000 hp should approximate 260 m.p.h.



FOR OVER-OCEAN SERVICE

Pan American Airways will order two of these 50 passenger boats. They will be equipped with sealed pressure cabins for high-altitude flying.

South Sea Adventure— FAA Buys 7,500-mile New Trail across Pacific to New Zealand

A 7,500-MILE TRANS-PACIFIC air route from San Francisco in California, New Zealand, was in the making last month. Pan American Airways, with 40,000 miles of airways already in operation, was preparing for a sunny flight via Honolulu, Singapore, Rangoon, and American Samoa.

Looking to establishment of service similar to the present Philippines service and the Great service which is scheduled to start April 25, the route

will be made in four travel days, against the present 10 days by steamer. Three years of study and preparation have gone into the project, which will tap a \$150,000,000 annual market for American goods.

Bendix establishes— A \$5,000,000 "reflexion city" at Teterboro, N. J.

A \$5,000,000 PLANT for the construction of the aeromedical sciences of the Bendix Aviation Corp. will be developed at Teterboro Airport, Teterboro, N. J., according to an announcement of Vincent Bendix. The corporation had more than 500 acres under option, of which it has bought 100 acres, holding the other 400 under a three-year option to protect the airport against future building. It is planned to change the name of the Teterboro community to Bendix, N. J.

Hindenburg's Season— To provide 18 U. S. Europe round trips. Rose will be Liekebusch

A SCHEDULE OF FREQUENT AIRSHIP trips between Frankfurt, Germany, and the Hind Air Station at Lakehurst, N. J., has been set for the Deutsche Zeppelin-Reederei's LZS Hindenburg this summer. Again opening its paying guests of the Mary, service will be covered by night round trips over last year's schedule.



THE NEWEST IN CYCLOPES

—A two-man, bicyclist model known as S-1000—shown to Congressmen by Wayne Aspinwall officials. All details in the picture are withheld by the Army, but Pan American has bought 10 TWA 75.

Airline Services—

Lines place new equipment on new, revised routes

LATEST DOMESTIC DATA for Douglas equipment in four American Airlines, which has just ordered seven more, at a cost of more than \$900,000 each. They will be delivered this summer and will bring American's complement of DC-3 series equipment to 20, of which 12 will be Douglas (DST) and 8 will be 26-passenger Sky planes (Cock Pioneers).

Avray Black, president of Varney Air Transport, Inc., has announced purchase of a fleet of Lockheed 12s, powered with 480 hp. Wasp, to be put in service within three months over the company's 25 Post, Tri-State, Ohio routes.

The Seattle Airlines extension into Mexico City (Aviation, November 1936) is scheduled to start about June 1, according to Traffic Manager Charles Boyd. Five Douglas DC-3s will be used for the service.

Army Buys—

Five A-23s and six Keltie outposts ordered to assist

A CONTRACT FOR FIVE SEEROBY A-23 AIRBORNE AND SPARE PARTS EQUIPMENT IN A BATTLE HAS BEEN LET BY THE War Department. Contract price is \$633,886—\$485,630 each. Deliveries will be made to the extent of including passenger seats with egress routes. The ships will be powered with two Pratt and Whitney Hornet engines of 750 hp each. Propeller to suit in conversion to long-range bombing flights.

On March 10 the Army announced procurement for six outposts, manufactured by the Keltie Airplane Corp. of Philadelphia. Cost is \$258,885. They will be used for reconnaissance, observation of air, carrying of messages, and command missions.

Secretary of War Woodring has announced the purchase of 141 Model B-23D-49 powered Wright Cyclone engines, at a total contract price of \$1,000,728. The engines, which develop 1,000 hp. for take off, are for installation in, and spare for, 800 North American B-24-A-1 Corps and Observation planes ordered last Nov. 79.

Wright Field openings of two-engine bomber bids on March 4 ended the following. On an order for 58 Douglas bid \$51,577, with a \$53,967 price for 250, with intermediate prices on increments of five

AVIATION'S Monthly Table
of Domestic and Export Commercial Airplane Deliveries

Manufacturer	Model	Engine (Horsepower)	Passenger & St. (Maximum normal load)	Type of Ship	Source
Douglas Aircraft Corp.	24	Wright Cyclone	Quon-Silverman	Private	NO-1386
	24	Wright Cyclone	B. V. Baker	Private	NO-1427
	24	Wright Cyclone	W. E. Carter	Private	NO-1431
	24	Wright Cyclone	C. P. Baker	Private	NO-1432
	24	Wright Cyclone	Pacific Aircraft Sales	Private	NO-1433
	24	Wright Cyclone	T. R. Smith	Private	NO-1434
	24	Wright Cyclone	B. C. Smith	Private	NO-1435
	24	Wright Cyclone	H. A. Jones	Private	NO-1436
	24	Wright Cyclone	Van Horn & Co.	Private	NO-1437
	24	Wright Cyclone	Local: Waco	Private	NO-1438
	24	Wright Cyclone	E. V. Clark	Private	NO-1439
	24	Wright Cyclone	George A. Ford	Private	NO-1440
	24	Wright Cyclone	G. E. Hall	Private	NO-1441
	24	Wright Cyclone	Waco Aircraft Corp.	Industrial	NO-1442
Republic Aircraft Corp.	10-10	Wright Cyclone	H. A. Thompson and J. E. Johnson	Commercial	NO-1443
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1444
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1445
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1446
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1447
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1448
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1449
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1450
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1451
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1452
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1453
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1454
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1455
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1456
Republic Aircraft Corp.	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1457
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1458
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1459
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1460
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1461
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1462
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1463
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1464
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1465
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1466
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1467
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1468
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1469
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1470
Republic Aircraft Corp.	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1471
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1472
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1473
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1474
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1475
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1476
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1477
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1478
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1479
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1480
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1481
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1482
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1483
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1484
Republic Aircraft Corp.	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1485
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1486
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1487
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1488
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1489
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1490
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1491
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1492
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1493
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1494
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1495
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1496
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1497
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1498
Republic Aircraft Corp.	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1499
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1500
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1501
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1502
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1503
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1504
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1505
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1506
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1507
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1508
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1509
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1510
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1511
	10-10	Wright Cyclone	W. E. Clark	Commercial	NO-1512

(Table continued on page 98)

LORD

SHEAR TYPE MOUNTINGS

Proved by aircraft manufacturers and operators the world over to be

THE MOST EFFICIENT VIBRATION DAMPERS



INSTRUMENT MOUNTS

For individual instruments, panels and subpanels. Prevent the transmission of vibratory disturbances to delicate instruments. Compact and of corrected die finish and steel used for load and vibration characteristics in precise sample absorption for active range of disturbance frequencies found in aircraft.



ENGINE MOUNTS

Prevents vibration absorption for larger engines and motor units engine stability under oil (light loads). Reduce vibration and sound levels in a unit mass. Available for both oil and air and engine mounts.



RADIO MOUNTS

For delicate suspension of radio apparatus in portable engine, more efficient operation and a reduction of warbling. Prevents radio apparatus from motion, test stands and vibratory disturbances. Resonance-coupled (aircraft) radio accessories.

Also in use for Tube Bases, Microphones, etc., for M-C Sets, Auxiliary Lighting Units, Battery Chargers, Engine Coolings, Landing Gear Mechanisms, Cabin and Landing Light Window Channels, Gun Tank Strap Circuits, etc.

LORD Shear Type Mountings are made of our high quality Steadfast alloy, bonded to metal attaching members. They possess great tensile strength, absolute uniformity, low permanent set, are subject to minimum warpage with temperature changes and have long life with no maintenance.

we will gladly work with designers, manufacturers and installers in any vibration mounting problem.
LORD MFG. CO., ERIE, PA.
"It Takes Labor to Shear to Absorb Vibration."

A New Achievement for a Famous Name

A great drama of life and death was enacted when the raging waters of the Ohio and Mississippi spread terror and disaster during the recent flood. Out of this great drama emerged the nation's act of heroes whose efforts saved thousands of lives from watery graves and controlled the inevitable aftermath of disease.

Bendix is proud to have been able to play a part in the timely rescue efforts of the many governmental and independent agencies. The Coast Guard, naval men, boats, planes and communication trucks, some equipped with Bendix transmitters, receivers and other equipment to the flooded area. In cooperation with the Naval Reserve, Army and Air Corps, they established a joint emergency radio net-



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Antenna Arrays

Low Temperature Equipment

Quartz Controls and Indicators

Vacuum Components

Fixed Components

Inductances

Frequency Standards

Frequency Meters

Frequency Meters

Frequency Meter Drivers

Synchroscopes

Radio Relays

Modulation Meters

Tube Testers

Set Testers

Remote Control Devices

Capacity Standards

Field Intensity Meters

work to facilitate rescue work and relieve human suffering. Such occasions as this bear testimony to the reliability and efficiency of Bendix Radio Corporation products under all conditions. Bendix Radio Corporation provides complete research, engineering and manufacturing facilities for every type of radio equipment.

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BENDIX

RADIO CORPORATION

NEW YORK WASHINGTON BOSTON CHICAGO OAKLAND

Aviation People

Who's who and what they are doing

Victims on the board of Curtiss-Wright Corporation are now being killed by men who are actively in charge of the company's principal operations (Wright Aeronautical Corp., Paterson, and Curtiss Aeroplane and Motor Co., Buffalo). In line with this policy the two new board members who have recently been added are ROBERT S. WYNN, vice-president of Curtiss-Wright Corporation who is in charge of the Curtiss Aeroplane Division; and M. B. GROSS, vice-president and general manager of Wright Aeronautical Corporation. Both men have been active in aviation development for many years.

An article by RICHARD W. YOUNG on "Air-Cooled Radial Aircraft-Engine Performance Possibilities" has won for him the Moody Memorial Medal, awarded by the Society of Automotive Engineers for the best paper relating to aircraft engine design, construction or research presented at its SAE meeting during the year. The medal honors the memory of CURTIS M. MOODY, associated with BENDIX. P. LAMBERT in his pioneering work as ATTACHED, President, by Dr. GEORGE W. LEWIS took place at the National Aeronautics Meeting of the SAE at Washington on March 12. Mr. Young is associated engineer with the Wright Aeronautical Corporation.

The experience gained from two years of aeronautical association will be carried over to the legal profession by JOHN S. WYNN, since 1933 chief of the airport, marking, and mapping division of the Bureau of Air Commerce. In resigning from the Bureau to engage in the private law in the District of Columbia, Mr. Wynn will act as technical adviser and counsel to aviation interests, with emphasis on legal phases. His work with the Bureau embraced participation in its airport section on the basis of an advisory service, concerning in the airport construction and improvement program undertaken as a work relief project. The program involved nearly 2,000 projects and an expendi-

ture of some \$60,000,000. Mr. Wynn also represented taxpayers of the aeronautical class for the most and General Survey, and the Bureau's air marking program. Prior to joining the Bureau, Mr. Wynn was general manager at Haverhill and spent five months in Washington-Beverly Airport.

Along with HOWARD HARRIS (Aviation, March 3, 63), JACK BARNES of New Zealand was declared outstanding aviator for 1936. Selection was made by the League Internationale des Aviateurs which annually presents the Harmon International Trophy for aviation achievement during the year. It was Mrs. BARNES' record-breaking solo flight from England to New Zealand which brought her the trophy. National growth went to LEO T. THOMAS, co-founder of the United States International record for women, and JAMES DAWSON, Jack Hooton of Fresno, who was also awarded by the League-United American name, received preferentially the Harmon International Trophy.

ROBERT Q. WILLIAMS, international flyer, has been named a director and technical adviser of Pan-Am Airline Corp. of Kansas City, with offices at New York City and at Floyd Bennett Airport, Brooklyn. Williams had served as a senior engineer at Moynihan, president of Harnold's Appliances Corporation, Annapolis, was also made of the appointment of Davis, Dallas as director of police relations for the company.

At the annual meeting of the Institute of the Aeronautical Sciences, the class of 1936, the president of the association at Caltech, was elected president. Other elections were: Vice-presidents STEPHEN M. FAIRCHILD, JACK PAUL, Dr. GEORGE W. LEWIS, E. E. WILSON, and T. P. WYNN; treasurer, ELMER A. STRECK, Jr.; secretary, HENRY L. LORAN; D. GARDNER, Chief; E. E. ALLEN, President; R. BARNES, LEO T. THOMAS, JACK T. THOMAS. Corporate members of the



Council are: C. E. CHAFFIN, C. H. GARDNER, LEO T. THOMAS, S. M. FAIRCHILD, PAUL GOLDMAN, C. L. LAMBERT, E. D. CHAFFIN, T. P. WYNN, HARRY LORAN, D. GARDNER.

LEWIS W. BARNES and CHAFFIN E. FAIRCHILD were elected respectively president and vice-president and general manager of Aeronautical Sciences Corporation. New officers elected were: BARNES WYNN, vice-president; G. M. BARNES, secretary;



Most American Airships are Equipped with FORMICA PULLEYS

Practically every leading maker of American aeroplanes equips its ships with Formica pulleys and Formica fairlead bunnings, and a very large percentage of the ships that have gone into use in recent years are so equipped.

They weigh about half as much as the lightest metal pulleys. Constant checking under Army and Navy specifications for run-out tolerances, static load, bending fatigue shear and resistance to fatigue assures uniformity.

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FORMICA

AVIATION
April 1937

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CHARLES L. LOWMEYER, assistant; FRANK J. WALSH, assistant secretary and assistant treasurer; ROBERT C. COMPTON, auditor; C. J. BROWNE, S. M. FARRER, W. A. MARK, CHARLES MARSH, T. A. HOBAN, G. W. VAUGHAN, G. S. WHEAT.

IN Telford Aviation Company's new factory manager, STANLEY J. VANOS, has been allied with aircraft production since 1913 when he joined GALT COASTAL in the development of preformers and postforms. From 1922 to 1928 he supervised construction of many of the Curtiss models while employed at the Curtiss Aeroplane Division on Long Island, and was later transferred to the company's Buffalo plant. His own monocoque fuselage was designed and patented in 1931.

IN Robert J. MINARDI, chief engineer of the Boeing Aircraft Co., was elected to the board of directors of Boeing Aircraft Co. and Boeing Airplane Co., the parent company. He fills the place left vacant by the resignation of GARDNER W. CASE, now with Glenn L. Martin Company. Mr. Minardi has been with Boeing since 1918, was made chief engineer in 1936.

IN American Airlines, seeking the new way to a man's heart, has elected the office of Cleveland and Division of Food Research over which Miss FRANK V. HANCOCK, American wife of a General, diploma, holds degrees in aviation and aviation from the College of Medicine in Peru, the University of Berlin, and the University of Geneva. Her practical experience was gained in her former connection as food consultant for the Royal Dutch Air Lines.

IN At the New York sales office of Lockheed Aircraft Corporation GEORGE B. SHAWVER will be found assisting CHAS. L. GIBBS. Shawver resigned from American Airlines a while back. He had been with the line since 1928, having occupied the passenger service at Hartford, Conn., been made assistant city traffic manager in New York, city traffic manager, assistant district sales manager, and then transferred from the traffic department to the operations department.

IN Appointments of supervisory personnel to fill new positions in the Operations Department have been announced by Pennsylvania-Continental Airlines. J. H. STICK, for many years

first pilot for Pennsylvania Airlines, becomes superintendent of flight operations with headquarters at Pittsburgh; LAWRENCE HARRIS, formerly maintenance manager of Central Airlines, is superintendent of maintenance with offices in Detroit; W. S. MARCHANT, heretofore assistant operations manager for Pennsylvania Airlines, is made superintendent of ground stations at Pittsburgh, and LEROY A. SYKES, for eight years with the U. S. Weather Bureau, joins the line as meteorologist, to be located at Pittsburgh.

IN Here and there on the air line, JACK A. TONKES has become district manager for Northwest Airlines at Detroit. Now district manager at Detroit for United Air Lines is DUDLEY V. O'LEARY. He takes the place left vacant by WILLIAM F. PETER'S transfer to Cleveland. . . President of American Airlines pilots are BEN L. MITCHELL, in special assignment to the supervisory manager at Fort Worth, E. L. RICHMOND, chief pilot of the transcontinental route, based at Fort Worth, and WAYNE W. BARNETT, chief pilot of the Chicago district. . . M. E. DUFFY has been placed in charge of American Airlines' Detroit office at Glenview. K. E. DORGAN has been appointed assistant to the vice-president in charge of operations.



JOHN J. HANCOCK



GEORGE A. SHAWVER

chief of Northwest Airlines, LEO B. FARMINGTON takes his place as general traffic manager at Kansas City. Jack will continue working in flying and will do commercial flying for Maine Airlines, Inc. at Bangor.

IN The following have been elected Honorary Fellows of the Institute of the Aeronautical Sciences: DR. W. W. DODD, President of the University of Illinois; GEORGE A. GALT, of St. Louis; THOMAS H. HARRIS, of England; and DR. HENRY L. HARRIS, of Germany.

IN EDWARD L. BUCKNER, president of Franklin & Rosecrans of Brooklyn, N. Y., has been made eastern district manager for Fairchild Aircraft Corporation. He will handle distribution of the personal and sports-type planes throughout the metropolitan area.

IN ROBERT S. HARR has resigned as manager of Air Service, Inc., to become first pilot in charge of all flying activities for Viking Flying Boat Company. He had previously been in charge of the Johnston, Pa., manufacturing plant.

IN JACK HARRISON, one of the Army's round-the-world pilots of 1935, is resigning his position as sales manager for Niagara Manufacturing Company and has accepted appointment as development engineer with Pump-Buying Service Corp. of Cleveland.

IN The Brazilian government has sent Col. AUGUSTO MOURA director, technical advisor of the Brazilian Army Air Corps, to the States to represent construction of their thirty recently ordered Ryan Stearman Aircraft Company Col. Moura, accompanied by his family, will make his temporary home in Wichita.

IN Recent visitors to this country from abroad include DR. DON THOMASSEN and DR. IRENE VON ZALCMEYER, Directors of Junkers Werke, Berlin, Germany. V. A. MONTAGNA, ANASTAS A. SIKORSKY, Chief Aero-Hydrodynamic Engineer, Moscow; DR. GERALD HENSCHEL, Berlin; FRANK J. C. RICHARDS, Baltimore, Australia; H. W. VANDERBILT, Redford; RICHARD F. BUCHHEIT, Stockholm; LT. E. TARK, Stockholm; GEORGE P. DUFFY, London; C. KNOTT, Amsterdam; A. FLEMMING, managing director of Royal Dutch Air Lines; and GERALD MARGRAVE, Director of Royal Netherlands Indian Air Force.

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Sinews of STEEL

U.S.S. AIRPLANE STRAND AND CORDS

AMERICAN STEEL & WIRE COMPANY

206 South La Salle Street, Chicago

Herald Square Food Product Company, New York, Report Number:

UNITED STATES STEEL

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Our 19 Wire Construction is designed to resist sudden strains and excessive vibration. It is a non-rigid galvanized cable of extremely

high tensile strength.

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Our 7 x 19 cord is extra flexible. It is made of six strands of stainless wire each around another strand of similar construction. A special grade of steel is used in this cord which accounts for its high tensile strength.

These products meet all of the requirements of the latest U. S. Army and Navy aircraft specifications and are available in either tuned, galvanized, or USS 30-5 Stainless Steel.

ACCESSORIES FOR 1937

Here's a classified directory of the principal firms that manufacture and/or distribute materials, supplies and accessories to the aviation industry. Included are materials and equipment for airplanes and engine manufacture, operation and repair also for use in

See also the Alphabetical Industry Directory which begins on page 119.

AIRCRAFT ACCESSORIES

Klein et al. • BDNF and the Adult Brain

C. E. SCHWAB LABORATORIES, INC.
111 West Monroe Street, Chicago
RAISED STAIRS ELEVATOR COMPANIES
Melbourne, Fla.
GOLD STAIRS, ELEVATOR COMPANY
THIRD AVENUE, N. Y.
NATIONAL STAIRWAY CO. 1735 Belden
St., St. Paul, Minn.
FRANCO-LIFT STAIRS COMPANY
Indianapolis, Ind.
FRANKS RATHBURN, INC., Reading
Pa.
WILLIAMS STAIRS ELEVATOR COMPANY
224 West 10th Street, Cleveland.

Keywords

ARMO SERVICE CORPORATION, 151
 Chancellor Square, Philadelphia, Pa.
 EASTMAN KODAK COMPANY (film)
 Rochester, N. Y.
 POLAROID GRAPHICS CORPORATION, 15
 Clarendon St., Rochester, N. Y.
 FRONTRAIL AERIAL CAMERA CORPORATION,
 Woodlands, L. L. N. Y.
 BRYNAR CAMERA COMPANY, Muskegon
 Airport, Cleveland, Ohio.

Simultaneous Controls

Ames Controls 1150 West Marquette Road Chicago, Ill.
Baker Ames Mfg. Co., Chicago, Ill.
BENTON AEROMETRICAL CORP.
1900, Long Island City, N. Y.
Ludwig & Emery Manufacturing
Company, Alma, Mich.
RECLAMER AUTO PARTS CO., INC.
Mentzel O.
SHOCKMAN PRODUCTS COMPANY
Kalamazoo, Mich.

Keywords: *Convergent validity*

JOHN A. ROSSIGNOL, Senior Consultant
THOMAS, N. J.
HADDAM WIND POWER CO., 220 Park
Ave., New York, N. Y.
ANTHROPE STREET & WISE CO., CHICAGO, ILL.

Aircraft Electrical Systems

BAKER CORPORATION, 70-26 South
 34th Street, New York, N. Y.
 CARSON ELECTRIC DISTRIBUTORS
 WEST AVENUE 30, LOS ANGELES, CALIF.
 EQUINE APPLIANCE CORPORATION, 400
 CHRYSLER, N. J.
 KAPLAN STEELWORKS CO., Stamford,
 Conn.
 GENERAL ELECTRIC CHIMNEY, Schenectady,
 N. Y.
 HEURY & KATZMAN, LTD., South St.
 100, New York, N. Y.
 KAPLAN-HUBBARD & COMPANY, Inc.
 Bridgeport, Conn.
 LITTLEJOHN LABORATORIES, 426 East
 10th Avenue, Chicago, Ill.
 TUNNEY INSURANCE COMPANY, Inc.
 170 Lexington Avenue, Brooklyn,
 N. Y.
 WESTINGHOUSE TESTING & MACHINERY
 COMPANY, East Pittsburgh,
 Pa.
 WESTINGHOUSE INSURANCE
 CO., Newark, N. J.

Abstract: Five Ethnologists

AMERICAN LA FRANK & POWER
INDUSTRIES INC., 100 E. LA FRANK
ST., CLARK, N. Y.

PLATE FILM ENTERT. CO., DEXTER, O

PRIMA MANUFACTURING COMPANY
300 RUTLAND AVENUE, NEWARK, N. J.

WALTER KISS & COMPANY INC., 14
CIDER STREET, NEW YORK CITY

PRIMA MANUFACTURING COMPANY
504 S. BROADWAY, CHICAGO, ILL.

Abstract

BAKERSHA AIRCRAFT CO., CORONA-
TOWN, Long Island City, N. Y.
Eco Aircraft Corporation, 15-N
11th Street, College Point, N. Y.

Microsoft Corporation

Agas Documenting Company, 307
West 129th Street, Cleveland, Ohio
Advertising Intergroup Company
Inc., 370 Second Avenue, New
York.

Columbia Road, Chicago, Ill. Branch, South Dear Street, Chicago, Ill. Branch, 1927. Hotel New York, New York, 1927. Hotel New York, New York, 1927.

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August 1987

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101

ACUTE CARPENTRY, Cleveland, Ohio.
BLUM-KRICK CO., 652 Parkside
Buck Building, Philadelphia, Pa.
CHRYSLER Corp. Works, Inc., 30-30
12th Street, Long Island City, N. Y.
INVESTIGATIONS, SOUTHERN CARPENTRY
Michigan and Butler Avenues, Co-
lumbus, Ohio.
INTERFABRICATIONS, DENNIS & EQUIP-
MENT COMPANY, 875 Madison Ave.,
Columbus, Ohio.
KAYLARD'S METAL TAPPING COM-
PANY, Rice and McGowan Streets,
Schuylkill, Pa.
H. H. ROBERTSON COMPANY, Great
Building, Philadelphia, Pa.
TOWNSHIP STEEL COMPANY, Youngs
10th, Ohio.

Airport Fences

ANDERSON STEEL AND WIRE COM-
PANY, 200 S. La Salle Street, Chi-
cago, Ill.
AUSTIN FENCE FARM COMPANY, East-
ern Avenue, Baltimore, Md.
OCEANO FENCE COMPANY, Fox Park
Avenue, North Chicago.
FARM FENCE COMPANY, Bridgeway
Cott., New York, New York, Ky.

Airport Fire Extinguishers

AMERICAN LAFFERTY & FRAMME
CORPORATION, Edison, N. Y.
BARNES FIRE EXTINGUISHING COM-
PANY, Park Square Bldg., Boston
Mass.
C.O. TWO FIRE EQUIPMENT COM-
PANY, Piquette Bldg., Newark, N. J.
FLAME FIRE EXTINGUISHING CO., Detroit, O.
FIRE-FIRE COMPANY, Detroit, O.
GARDNER EXTINGUISHING CORPORATION,
Waukegan, Ill.
GENERAL FIRE TRUCK CORPORATION,
Fulton Park Bldg., St. Louis, Mo.
WALTON KIRBY & COMPANY, 340
Cedar Street, New York, N. Y.
THE FORTIER MANUFACTURING COM-
PANY, 625 East Pearl Street, Colum-
bus, Ohio.
FRANK MANUFACTURING COMPANY,
500 Edison Avenue, Newark,
N. J.
FRANKS FIRE EXTINGUISHING MANU-
FACTURING COMPANY, 20th and
Tenth Streets, St. Louis, Mo.
WILKINSON EXTINGUISHING CORPORA-
TION, Washington, D. C.

Airport Fuel Aid Equipment

BAKER & BLACK, 200 South Dear-
born Street, Chicago, Ill.
E. D. DELANGE COMPANY, 255 8th
Street, San Francisco, Cal.
BROOKINGS WILCOX & COMPANY
INC., 9-11 E. 4th Street, New
York, N. Y.
DAVIS EMERGENCY EQUIPMENT COM-
PANY, INC., 31 Warden Street, New
York, N. Y.
JOHNSON & JOHNSON, New Roch-
ester, N. Y.
MORSE SAFETY APPLIANCE COMPANY,
Pittsburgh, Pa.

SEABURY & JOHNSON, 227 4th Ave.
New York, N. Y.
L. L. SORRELL & SONS, 2nd and Arch
Streets, Philadelphia, Pa.

Airport Fuel Systems

AIRCO SYSTEMS, INC., 2840 Third
Avenue, New York, N. Y.
E. F. BROWN & COMPANY, INC.,
First Wagon, Inc.
COLUMBIAN STEEL TANK COMPANY,
Kansas City, Mo.
GILBERT & SARGENT MANUFACTURING
COMPANY, Springfield, Mass.
E. F. GORDON RUBBER COMPANY,
Akron, Ohio.
TWO LIQUIDMETER CORPORATION,
36-18 56th Avenue, Long
Island City, N. Y.
MORSE INDEPENDENCE, INC., 255 Eu-
geney Avenue, Newark, N. J.
PETERSON SEAL COMPANY, 100-24
South Avenue, Queens, N. Y.
PETERSON ENGINEERING SERVICE COM-
PANY, Cleveland, Ohio.
REYNOLDS-MARKETPLACE COMPANY,
Inc., Newark, N. J.
SEYMOUR FURNITURE MANUFACTURING COM-
PANY, Dublin Avenue and Gifford
Street, Springfield, Ohio.
SWIFT LUBRICATING COMPANY, El
mira, N. Y.
TAYLOR & HOBBS MANUFACTURING
COMPANY, Stamford, Conn.

Airport Routes

AMERICAN AIRWAYS CORPORATION,
600 Broad Street, Detroit, Mich.
AMERICAN AIRWAYS CORPORATION,
Lansing, Michigan.
AMERICAN AIRWAYS CORPORATION, 40
W. 40th Street, New York, N. Y.
BETTER AIRWAYS CORPORATION, Bal-
timore, N. Y.
CLARKSON AIR COMPANY, 500 7th
Avenue, New York, N. Y.
GARDNER AIR, INC., 220 Grand Ave-
nue, Brooklyn, N. Y.
THE ELECTRIC VEHICLE COMPANY,
11 Park Street, New York, N. Y.
MORSE MANUFACTURING COMPANY,
361 Park Avenue, New York,
N. Y.
SERVICES AIRWAYS MANUFACTURING
COMPANY, INC., 1400 South Vi-
ctoria Avenue, St. Louis, Mo.
E. F. SORRELL COMPANY, 2nd
Park Street, Mass.
THE TRUCK COMPANY, 2nd and Cen-
tral Avenue, LaCrosse, Wis.
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Lexington Avenue, New York,
N. Y.
UNITED AIRWAYS CORPORATION, 47-48
20th Street, Long Island City,
N. Y.
VIRK, HENTON AND VENTURA
CORPORATION, Philadelphia, Pa.

Airport Lights and Accessories

ALL AMERICAN, Bensenville, Ill.
L. E. N. Y.
AMERICAN AIRPORT EQUIPMENT COM-
PANY, 205-40 Washington Bou-
levard, Chicago, Ill.

AMERICAN CABLE COMPANY, 230 Park
Avenue, New York, N. Y.
AMERICAN CABLE ACCESSORIES, Edin-
burgh, N. Y.
ANDERSON WIRE & CABLE COMPANY,
Brooklyn, New York, N. Y.
AIR-WAY EQUIPMENT CORPORATION,
Milwaukee, Wis.
BARNES BUILDING, INC., 105 Walnut
Street, Philadelphia, Pa.
S-S-T CORPORATION of America, 1420
Newark Avenue, Philadelphia, N. J.
BARNES BUILDING, PHILADELPHIA COM-
PANY, 105 Walnut Avenue, De-
troit, Mich.
COTTE-HARRIS COMPANY, Spokane,
Wash., N. Y.
CUTLER HARRISON COMPANY, Twelfth
and St. Paul, Milwaukee, Wis.
GENERAL CABLE COMPANY, 420
Lexington Avenue, New York
HARRIS INSULATED WIRE WORKS,
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1000 West Adams, Chicago, Ill.
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LAURENCE PHILADELPHIA COMPANY,
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NATIONAL CABLE, 3000 South
Lansing, Lincoln Building, New York
NICHOLS BATTERY AIRPORT COM-
PANY, Inc., Newark, N. Y.
CLAYTON NICHOLS, Inc., 41 East
4th Street, New York, N. Y.
THE PHILADELPHIA COMPANY,
South Eastern Avenue, Chicago.
JOHN A. ROBERTSON BOND COMPANY,
605 S. Third Street, Trenton, N. J.
SUN AIRWAYS CORPORATION, 49
West 45th Street, New York, N. Y.
VENTURA ELECTRIC & MECHAN-
ICALS COMPANY, East Philadel-
phia, Pa.

Airport Rools

BELLEVILLE AIRPORT CORPORATION, Wel-
lington, D. C.
HARTLEY BARNES CORPORATION, 12
Broad Street, New York, Mass.
BARNES BUILDING, INC., New
York, N. Y.
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York, N. Y.
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BARNES BUILDING, INC., New
York, N. Y.
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York, N. Y.

Airport Scaffolding Systems

GARDNER STEEL, Inc., 230 East An-
derson, Brooklyn, N. Y.
VIRK CORPORATION, Hastings, Mich.

Airport Towers

THE BARNES BUILDING COMPANY,
Columbus, Ohio.
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GLASS TRANSDUCER COMPANY, Buffalo, N.Y.
 CLEVELAND TRADING COMPANY, Cleveland, Ohio
 INTERTECHNICAL INDUSTRIES COMPANY, 400 So. Michigan Avenue, Chicago, Ill.
 KLEINER MANUFACTURING COMPANY, Delapine, La.

Alloys—Miscellaneous

ALCO ALUMINUM, INC., Rochester, N.Y., L. L. M. E.
 AIR RESEARCH SALES COMPANY, (supplying supplies), 30 E. 43rd Street, New York, N. Y.
 AMERICAN AIRPORT EQUIPMENT COMPANY, 1044 Washington Boulevard, Chicago, Ill.
 JOHN BIRD MANUFACTURING COMPANY (battery chargers), 217 W. Tenth Street, San Jose, Cal.
 BIRD'S MANUFACTURING COMPANY (auto repair equipment), 314 Central Avenue, Chicago, Ill.
 BLACK & BRIDGE MANUFACTURING COMPANY (power tools), Towson, Md.
 E. D. BOLLER COMPANY, 220 So. First, San Francisco, Cal.
 BRUNNEN BROTHERS (battery chargers), Duluth, Minn.
 DUNN COMPANY (auto repair equipment), Toledo, Ohio.
 ENGINEERING & RESEARCH CORPORATION (machine tools), Washington, D. C.
 ELLIOTT & THOMAS COMPANY (machine tools), 120 Colburn Boulevard, Detroit, Mich.
 JOLIAN P. FARR & SONS, Inc. (tool and instrument), Baltimore, Md.
 GEMMA ELECTRIC COMPANY, Schenectady, N. Y.
 HARRIS MANUFACTURING COMPANY (aircraft), Worcester, Mass.
 HUBBARD BROS. COMPANY (battery chargers), Troy, Ohio.
 HUNTERMAN VALVE MANUFACTURING COMPANY (pneumatic), 2001 A. P. O. Box H, Chicago, Ill.
 IMPROVED PROGRESSIVE TOOL COMPANY (power tools), 688 West Jackson Boulevard, Chicago, Ill.
 LORIE AIR SERVICE COMPANY (aircraft supplies), 362 East 43rd Street, New York, N. Y.
 THE ALABAMA BELL COMPANY (auto repair equipment), 1445 West Baltimore Street, Baltimore, Md.

NEWELL-BENTLEY AIRPLANE COMPANY, Montreal, Mo.
 PARKER AIR RACING COMPANY (auto repair equipment), Chicago, Ill.
 PRATT & WHITNEY AIRCRAFT SERVICES, LTD., Philadelphia, Pa.
 PROGRESSIVE COMPANY, 1905 24 South Western Avenue, Chicago, Ill.
 A. SCHMIDTKE SON, Inc. (instrumental air equipment), Roselle, N. J.
 SARGENT, INC. (auto tools), 3338 Edison Avenue, Chicago, Ill.

SHAWNEE PISTON, INC. (oil & iron), 1022 Schiller Street, St. Louis, Mo.
 NORTH VALLEY EQUIPMENT COMPANY, 203 1/2 East S. E., Minneapolis, Minn.
 NORTH VALLEY LIVERY WARE (airplane tools), South Bend, Ind.
 THE SARGENT WORKS (tools and hardware), Lake Street, New Britain, Conn.
 TAYLOR INSTRUMENT COMPANY (tool and instrument), Rochester, N. Y.
 JOHN CARROLL & COMPANY CORPORATION (aircraft supplies), 30 E. 43rd Street, New York, N. Y.
 WOODWARD MANUFACTURING COMPANY (aircraft instruments), 616 Philadelphia Avenue, New York, N. Y.
 WOODWARD ENGINE & MANUFACTURING COMPANY (machine and instrument, battery chargers, etc.), East Philadelphia, Pa.
 S. S. WOOD RAILROAD MANUFACTURING COMPANY (power tools), 20 E. 43rd Street, New York, N. Y.
 TAYLOR & FRANKLIN MANUFACTURING COMPANY (auto tools), Philadelphia, Pa.

ENGINE ACCESSORIES

Engine Components

BRUCE AIRPLANE COMPONENTS, South Bend, Ind.
 CHARLES-DAVIS COMPANY, Detroit, Mich.
 HALEY CARPENTERS COMPANY, Vicksburg Avenue, Detroit, Mich.
 ZEVITZ CARPENTERS, Detroit, Mich.

Engine Exhaust Mufflers

AMERICAN TIRE ENGINE COMPANY, New Haven, Conn.
 BROWN AIRCRAFT COMPANY, Canton, Long Island City, N. Y.
 ELLIOTT AIRCRAFT COMPANY, 220 Jackson Avenue, Detroit, Mich.
 ENGL AIRCRAFT STRUCTURES, 1729 Standard Avenue, Glendale, Cal.
 HALL AIRCRAFT STRUCTURES COMPANY, 414445 Body Street, Cincinnati, Ohio.
 SARG AIRCRAFT COMPANY, Ltd., 1723 West Jasper Street, San Diego, Cal.

Engine Fuel Systems

EMER AIRPLANE COMPANY, 251 Vermont Avenue, Detroit, Mich.
 FORTNORTH COMPANY, 2905 24 South Western Ave., Chicago, Ill.
 FOUNTAIN ENGINE & SUPPLY COMPANY, 211 East 41st Street, Cleveland, Ohio.
 ROBERT PEAR COMPANY, Elgin, Ohio
 THE SARGENT ENGINEERING COMPANY, Springfield, Ohio
 GEORGE AIRPLANE PRODUCTS, Dayton, Ohio.

Engine Ignition
 BENSON MARINE COMPANY, Buffalo, N. Y.
 BOWELL MARINE COMPANY, Inc., Selkirk, N. Y.
 UNITED AMERICAN MOTOR COMPANY, Springfield, Mass.

Engine Valves and Seats

AMERICAN HANDBOOK PISTON RING COMPANY, Baltimore, Md.
 THE BIRD COMPANY, 204 Niagara Street, San Francisco, Cal.
 THE CHAS. FISHER COMPANY, 322 St. Clair Avenue, Cleveland, Ohio
 THE HUNTERMAN VALVE COMPANY, 2001 A. P. O. Box H, Chicago, Ill.
 SHARP PISTON COMPONENTS, Madison, Wis.
 SARGENT PISTON RING SUPPLY COMPANY, Cleveland, Ohio.
 U. S. HANDBOOK PISTON RING COMPANY, Inc., Lansing, N. J.
 WILKINSON MANUFACTURING COMPANY, Philadelphia, Pa.

Engine — Radiators

THE G. & D. MANUFACTURING COMPANY, 128 Washington Avenue, New Haven, Conn.
 HANDBOOK ENGINE CORPORATION, Longport, N. Y.
 MCCOY ENGINE & MANUFACTURING COMPANY, Detroit, Mich.

Engine Building and Wiring

AMERICAN CYCLE COMPANY, 300 Park Avenue, New York, N. Y.
 BALDWIN MANUFACTURING COMPANY, 660 West Van Ness Street, Chicago
 BAKER CORPORATION, Inc., 34 South Sixth Street, Newark, N. J.
 DAVIS AIRPLANE CORPORATION, Selkirk, N. Y.
 GENERAL CYCLE CORPORATION, 425 Lombard Avenue, New York, N. Y.
 PACIFIC ELECTRIC CORPORATION, Whittier, Calif.
 SUTTELLA MANUFACTURING COMPANY, Selkirk, N. Y.

Engine — Spark Plugs

AC SPARK PLUG COMPANY, 500 Harvard Street, Flint, Mich.
 ARCO SPARK PLUG CO., Inc., 428 Lexington Ave., New York, N. Y.
 THE B. O. CORPORATION, 126 West 43d Street, New York, N. Y.
 CHAMBERLAIN SPARK PLUG COMPANY, Toledo, Ohio.

Engine Starters

ALMA SUPPLY COMPANY, Cotte, Pa.
 ROSS AIRPLANE CORPORATION, E. Chicago, N. J.
 FARRAR, L. L. & SONS, Inc., Pittsburgh, Pa.

Engine Tools

AMERICAN COMPANY OF AERIAL, Pittsburgh, Pa.

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CONTEXT OF ALL STRUCTURAL DETAILS

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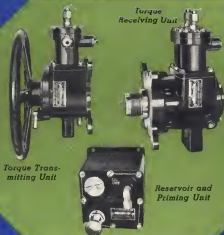
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